You have FHIR resources. We have a fully-managed, compliance-focused FHIR API ready for you.

Learn more and get started by visiting cloud.google.com/healthcare
Hello there and welcome to DevDays!

First of all, there's something I have to get off my chest.

We are not an event company.

Yes, we run DevDays and, yes, we love it. But you know what? Our core business, in the spare moments between organizing DevDays, is programming. We build software. FHIR software for implementers. DevDays just sort of happened to us. We came up with the idea on a boring afternoon, and said, yeah, let's do that, let's ask some people over for a few FHIR tutorials and some hacking, plus the usual pizzas & beers.

That was back in 2014. There was nowhere you could go to learn FHIR and everyone liked the event. So we did it again the year after. More people showed up, and they liked it even better. And so one, every year.

A sound business strategy requires focus. But we're torn between two lovers: coding and DevDays. So I'll tell you a secret: the reason we have a lot of hands-on and hacking going on at DevDays is that we finally find some time for coding ourselves, after all the weeks of preparing the event. It's the only way to keep doing the two things we like best.

Rien Wertheim
CEO Firely B.V.

It’s my pleasure to welcome you to DevDays in Amsterdam.

The FHIR community is growing – both in size and impact.

How is this for size? On the FHIR chat on Zulip (chat.fhir.org) we now have 800 active users, and a total of 5900 registered users. The number of messages on the chat has grown to 195 thousand in less than 2 years (I think there's only a few of us that manage to keep up with everything...)

The growth of DevDays over the last five years is another indicator, starting at around 2 dozen at the Furore (now Firely) office in 2014, now selling out for both the US and the European edition. I love DevDays, and I'm really pleased to be here with you.

But the numbers don't mean anything in itself. The true value lies in the people behind those numbers – a community sharing together to make a difference in healthcare. A while ago I tweeted that the FHIR acronym might be “Far Harder In Real-life”. I was sort of joking – but health is hard. Change is even harder. But we all desperately need it.

I travel around the world a lot. Everywhere I go, people tell me that the way healthcare is paid for and managed is the problem, or that their country is somehow specially bad. But the problems are pretty much the same nearly everywhere I go – irrespective of how things are managed. The real problems are cultural and tied deeply to information flows and processing.

For FHIR to really have an impact in real life, we need to solve those problems. And to do that, we depend on people like you, working at the coal face, telling us what is good and what isn't. The more people apply FHIR, the better it will get, the more people will use it. It's a give and take. Thank you for giving, thank you for taking.

Let's make it clear that what FHIR really means is “Family of Healthcare Interoperability Revolutionaries”!

Grahame Grieve
FHIR Product Director at HL7 International
**PUBLIC TRANSPORTATION TICKET**

At the registration desk, we offer you a complimentary 3-day GVB ticket. The GVB is the public transportation company in Amsterdam. This ticket provides you with unlimited travel on all GVB routes, regardless of distance, both day and night. The ticket becomes valid the first time you check in.

**PARKING**

B. Amsterdam has a large car park at the top floor of building B1. It is a 5 minute walk to building B.3. Ask our crew at the registration desk for a complimentary parking ticket.

**REGISTRATION DESK – OPENING HOURS**

On all conference days the registration desk is located in the Atrium of B Amsterdam, Building B.3. The registration desk is open at the following hours:

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Wednesday</td>
<td>07:15 – 20:00</td>
</tr>
<tr>
<td>Thursday</td>
<td>07:30 – 16:30</td>
</tr>
<tr>
<td>Friday</td>
<td>07:30 – 16:00</td>
</tr>
</tbody>
</table>

**BADGE**

Please wear your conference badge at all times.

**CLOAKROOM AND LUGGAGE**

You can leave your belongings in the cloakroom, including suitcases on the last conference day.

**MEALS AND BREAKS**

Your registration fee includes:

- Lunches on Wednesday, Thursday and Friday
- Dinner on Wednesday
- Social event and dinner on Thursday
- Farewell drinks on Friday
- Coffee, tea and water will be available throughout the day.

**LANGUAGE**

The official language of the Devdays 2018 is English.

**CONFERENCE STAFF**

Questions or help needed? Conference crew members, recognizable by their outfit, are available to assist you with the conference logistics.

The Firely Team, wearing yellow shirt, are also present to help you with any FHIR related issues or to introduce you to speakers or other participants.

**ANNOUNCEMENTS**

A notice board will be available close to the Registration Desk. Please check this board daily for any announcements and updates on the program.

**EXERCISES**

Exercises are available for a selection of the tutorials. You can find them on the website at www.fhirdevdays.com

**PRESENTATIONS**

Did you miss out on the session or do you want to see the presentation once more? All sessions will be recorded. Links to the available videos and slides can be found on the conference website after the event.

**PHOTGRAPHER**

A photographer is present on Thursday, 15 November. After lunch, he will take the official DevDays group picture, so please attend!

**NETWORKING**

The Community Track offers a platform for the sharing of implementation experiences and best practices in a series of presentations.

The venue set-up and social event provide the attendees with the opportunities to connect to other participants and share ideas on challenges and solutions.

**EVALUATION FORM**

Your feedback is important! After the event, you will receive a link to the online evaluation form. Please take a moment to complete this form, as we will use your feedback to improve our future events.
WHAT HAPPENS IN THE BACKROOMS

At the DevDays venue we have a number of small and not-all-that-small rooms for ad-hoc sessions. If you want to organize an ad-hoc session, come up to the registration desk and we will do our utmost to accommodate you. Keep an eye on the announcements screens to know what’s going on. Some of the most interesting stuff at DevDays is happening in the backrooms. As always.

Birds of a feather sessions (BoFs): workshops and spontaneous sessions with participants who share an idea or a challenge, related to one of the tutorials.

Geeks Only Sessions: sessions on super advanced topics (“FHIR and quantum mechanics”) where the experts speak jargon. “Geeks” as a badge of honor of course.

Boiler Room Sessions: want to work on your own use-case with other participants or your team at DevDays? Claim one of the small rooms and go at it. Ask for one of the Yellow Shirts (Firely Team) or speakers to assist you.

STUDENTS AND STARTUPS

Student Track
On Thursday, 15 November 2018, we organize the student track, during which a number of universities compete for the Student Track Cup.

During a hackathon, the students engage with other teams and compare their solutions or assignment. In the afternoon, the teams present their results during a short presentation, after which the winner will be announced.

The Student Team Presentations are scheduled from 13.45 – 15.30 and is open to all attendees!

Competing universities
- University of Applied Sciences Upper Austria, Austria
- Hochschule Niederrhein, Germany
- Miyagi University, Japan
- Bern University of Applied Sciences, Switzerland
- University of Amsterdam, the Netherlands
- Hogeschool Rotterdam, the Netherlands

Startup Track
A new addition to this year’s DevDays is the Startup Track, which will take place on 15 November.

Five startups have been selected to compete:
- Alii.care, Netherlands
- Beter Dichtbij, Netherlands
- GoClinic, Netherlands
- Lifen, France
- Nuvyta SRL, Italy

Their products will compete on:
- how FHIR enables the concept to work
- how innovative the idea is
- the business value their product offers

The product pitches (5 minutes each) and prize awards are scheduled from 15:45 – 17:00 hours.

Please come. Don’t miss their presentations.

THE STARTUP TRACK IS SPONSORED BY

CONCLUSION

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THE STARTUP TRACK IS SPONSORED BY

CONCLUSION
THE NICE THINGS AT DEVDAYS

Chair massage
Take some time to relax while enjoying a chair massage.

The professional therapists are at the conference on:
Wednesday: 14:30 – 17:30 hrs
Thursday: 12:00 – 16:00 hrs

Pool competition
New: the DevDays Pool Competition!

During the 3 conference days, we organize a pool ladder competition.
Want to join? Come to the registration desk and subscribe!

Chair yoga
We sit too much and move too little. This is creating tension and pain in our body. That is why yoga at work is evolving fast. Yoga creates space in your body, so body fluids can regenerate the tissues and joints and keep them healthy.

During this short class you will learn a sequence of movements you can do daily at your office. These yoga poses will help you increase your focus, enhance productivity and body awareness and release feelings of stress. By doing this you reduce the risk of RSI and burnout.

Room Chalet 1
Wednesday 14.45 – 15:25
Thursday 14.45 – 15:25

Introduction to a Heartful life
Train your focus and intuition by developing your awareness. Becoming aware of your different states of being, you can have more control over your emotions and create a higher level of focus, inner peace and a feeling of well-being.

In this introduction you will learn to observe your awareness, how you are living and how to reduce stress or negative feelings. Train your mind to be in the moment and focus.

Room Chalet 1
Wednesday 15.35 – 16:15
Thursday 15.50 – 16.30

Both sessions are provided by Mariken Fliervoet from Yoga Roots.

LET’S PLANT SOME TREES FOLKS!

FHIR would never have been there, without AirFrance KLM, Air Canada, Qantas and Delta flying the standards people across the globe to meet at connectathons and work group meetings. Don’t even try to calculate the carbon dioxide emission FHIR has caused. We are improving healthcare and ruining the planet in the process. FHIR DevDays doesn’t make it any better. Last year’s edition had 350 people from 25 countries, most of them flying in at Schiphol Airport. And hey, we are already below sea level, remember?

So, what do we do?
We do what the airlines do, but slightly different. When you bought your ticket for DevDays, you had the possibility to add a tree to your order. Were you not able to buy a tree while registering, but do you wish to buy one now, no worries, because we will have a donation box available. Price per tree is € 5.-

For every tree that you buy, Firely will buy another. On November 30st, we will plant those trees ourselves in the Netherlands, with the help of Trees For All. We’ll post some photos on Twitter.
HOW TO GET AROUND IN AMSTERDAM

Currency and banking
The currency in The Netherlands is the Euro (€). Foreign currencies are readily exchanged at airports and banks. In general, all major credit cards are accepted for payment in hotels, restaurants and shops (except supermarkets). Bank debit or credit cards are the most convenient means of getting cash at the many 24-hours-access automated banking machines (ATM) available in Amsterdam.

Tipping
Service is always included. However, it is customary to tip in restaurants, in bars and when paying for taxis. As a general rule, tipping between 5-10% is appropriate.

Transportation
Amsterdam is a very compact city, and so your destination will usually not be at a great distance. This makes the city ideal for getting around on foot, by bicycle or by public transport. Amsterdam has a very dense public transport system, and the nearest stop of a suitable tram, metro or bus is usually around the corner. Cars are less suited for getting around in Amsterdam, because parking rates are substantial in almost the entire city.

SOCIAL EVENT AND DINNER ON THURSDAY 15 NOVEMBER

Join us for the social event, one of the highlights of DevDays!

On Thursday evening, we are heading for ZuidPool (South Pole), a venue with authentic winter scenery. But do not worry, it will be warm and cozy! At ZuidPool, you can drink, eat and socialize with colleagues and friends. Several activities will be organized, like parlor games and even whisky tasting!

A great evening to get together with your FHIR friends, so hope to see you there!

PROGRAM

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>17:15-17:30</td>
<td>Gathering for social event outside the venue B 3. Amsterdam</td>
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<tr>
<td>17:30-18:00</td>
<td>Travel by bus to the location (included)</td>
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<tr>
<td>18:00-21:30</td>
<td>Social event and dinner at ZuidPool</td>
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<tr>
<td>20:45 and 21:30</td>
<td>One bus will make one trip to the following hotels: Hotel Corendon and Hotel Artemis (first come first serve)</td>
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<tr>
<td>21:30</td>
<td>Leave ZuidPool to explore Amsterdam on your own</td>
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### SCHEDULE | WEDNESDAY 14 NOVEMBER 2018

<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Session</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>07:30</td>
<td>Atrium</td>
<td>REGISTRATION 07:30 - 08:30</td>
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<tr>
<td>08:00</td>
<td>The Louis</td>
<td>Opening Ewout Kramer</td>
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<td>08:30</td>
<td>The Howard</td>
<td>Google Cloud FHIR API 09:00 - 09:40</td>
<td>Kurt Ericson</td>
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<td>XDS and FHIR 09:00 - 09:40 Gregorio Canal</td>
<td>Gregorio Canal</td>
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<tr>
<td>09:00</td>
<td>The Kari</td>
<td>FHIR IN THE CLOUD 09:00 - 09:40</td>
<td>Grahame Grieve</td>
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<td>Kas</td>
<td>FHIR IN THE CLOUD 09:00 - 09:40</td>
<td>Rik Smithies</td>
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<td></td>
<td>Meeting Units</td>
<td>FHIR4 and what comes after 09:00 - 09:40</td>
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<tr>
<td></td>
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<td>Introduction to FHIR 09:00 - 09:40</td>
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## SCHEDULE | WEDNESDAY 14 NOVEMBER 2018

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### JavaScript Full stack development
- **10:15 - 10:55**
  - Abigail Watson
- DEVELOPERS

### Building a FHIR client with HAPI and .NET (1)
- **10:15 - 10:55**
  - James Agnew, Mirjam Baltus
- DEVELOPERS

### SMART on FHIR
- **11:05 - 11:45**
  - Josh Mandel
- EHR

### Clinical Notes
- **11:55 - 12:35**
  - Michelle Miller
- EHR

### Terminology and Terminology Services
- **11:55 - 12:35**
  - Russ Hamm
- TERMINOLOGY

### Community (Projects)
- **10:15 - 10:55**
  - Thomas Papke, Oliver Krauss
- COMMUNITY

### Questionnaires / SDC
- **10:15 - 10:55**
  - Lloyd McKenzie
- MEDICAL RESEARCH

### Scheduling
- **11:05 - 11:45**
  - René Spronk
- EHR

### FHIR for clinical research
- **11:05 - 11:45**
  - Sebastiaan Knijnenburg
- MEDICAL RESEARCH

### Extending Vonk FHIR server
- **11:55 - 12:35**
  - Christiana Knaap
- DEVELOPERS

### Profiling in practice (Academy)
- **11:55 - 12:35**
  - Lilian Minne
- FHIRE FOR MODELERS

### LUNCH
- **12:35 - 13:30**
## SCHEDULE | WEDNESDAY 14 NOVEMBER 2018

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<tbody>
<tr>
<td>13:30</td>
<td><strong>Stand-up keynote</strong></td>
<td><strong>FHIR in Microsoft Azure</strong></td>
<td><strong>Searching in FHIR resources</strong></td>
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<td></td>
<td>Janet Campbell</td>
<td>14:00 - 14:40 Michael Hansen</td>
<td>14:00 - 14:40 Alexander Zautke</td>
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<td><strong>FHIR IN THE CLOUD</strong></td>
<td><strong>DEVELOPERS</strong></td>
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<tr>
<td>14:00</td>
<td><strong>Grab a coffee and code</strong></td>
<td><strong>FHIR in Microsoft Azure</strong></td>
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<td><strong>FHIR IN THE CLOUD</strong></td>
<td><strong>DEVELOPERS</strong></td>
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<tr>
<td>15:30</td>
<td><strong>Deploying FHIR data in AWS</strong></td>
<td><strong>FHIR in Microsoft Azure</strong></td>
<td><strong>Searching in FHIR resources</strong></td>
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<tr>
<td></td>
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<td>15:35 - 16:15 Chris McCurdy</td>
<td>14:00 - 14:40 Alexander Zautke</td>
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<td><strong>FHIR IN THE CLOUD</strong></td>
<td><strong>DEVELOPERS</strong></td>
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<tr>
<td>16:00</td>
<td><strong>Chair yoga</strong></td>
<td><strong>FHIR profiling</strong></td>
<td><strong>Introduction to a heartfelt life</strong></td>
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<td>14:45 - 15:25</td>
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<tr>
<td>16:30</td>
<td><strong>Introduction to a heartfelt life</strong></td>
<td><strong>FHIR profiling</strong></td>
<td><strong>Chair yoga</strong></td>
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</tbody>
</table>
SCHEDULE | WEDNESDAY 14 NOVEMBER 2018

Atrium

16:30
Grab a coffee and code
16:15 - 16:55

17:00
FOOD, DRINKS and MORE CODING
17:00 - 20:00

17:30

18:00

18:30

19:00
Lightning Talks
19:00 - 19:30

The Louis

16:30
Terminology on FHIR
16:15 - 16:55
Russ Hamm
TERMINOLOGY

17:00

17:30

18:00

18:30

19:00

The Howard

16:30
Security in FHIR - think like a hacker
16:15 - 16:55
Andrew Marcus
DEVELOPERS

17:00

17:30

18:00

18:30

19:00

The Kari

16:30
How to build a FHIR server with HAPI
16:15 - 16:55
James Agnew
DEVELOPERS

Kas

Meeting Units
## SCHEDULE | THURSDAY 15 NOVEMBER 2018

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<tbody>
<tr>
<td>07:30</td>
<td>Registration: 07:30 - 08:30</td>
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<td><strong>Opening</strong> Ewout Kramer</td>
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<td>09:00</td>
<td>GraphQL, FHIR and Javascript</td>
<td>FHIR Proficiency certification prep</td>
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<td>09:00 - 09:40 Robert Winterbottom</td>
<td>09:00 - 09:40 Simone Heckmann</td>
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<td>DEVELOPERS</td>
<td>CERTIFICATION</td>
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<tr>
<td>09:30</td>
<td><strong>COFFEE BREAK</strong> 09:40 - 10:15</td>
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### Developers

**FHIR Proficiency certification prep**
- Simone Heckmann

### Certification

**Opening Student and Startup Track**
- Lilian Minne, James Agnew, Abigail Watson, Vadim Peretokin

### Medical Research

**R on FHIR**
- Sander Laverman

**Geeks Only Sessions**
- Speakers to be announced
<table>
<thead>
<tr>
<th>Time</th>
<th>Atrium</th>
<th>The Louis</th>
<th>The Howard</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30</td>
<td>Order management and Results reporting</td>
<td>Building apps for EHR App Stores</td>
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<tr>
<td></td>
<td>10:15 - 10:55 Rene Spronk</td>
<td>10:15 - 10:55 Abigail Watson</td>
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<td>EHR</td>
<td>APPS</td>
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<td>FHIR testing and system certification</td>
<td>FHIRCast</td>
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<td>11:05 - 11:45 Richard Ettema</td>
<td>11:05 - 11:45 Leo Bergnéhr</td>
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<thead>
<tr>
<th>Time</th>
<th>The Kari</th>
<th>Kas</th>
<th>Meeting Units</th>
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<tbody>
<tr>
<td>10:30</td>
<td>Implementation Guide (IG) Tooling</td>
<td>New FHIR resources for Pharma Industry</td>
<td>Geeks Only Sessions</td>
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<td>10:15 - 10:55 Lloyd McKenzie, Ardon Toonstra</td>
<td>10:15 - 10:55 Rik Smithies</td>
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<td>FHIR projects</td>
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<td>11:05 - 11:45 Mohannad Hussain</td>
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<tr>
<td>13:30</td>
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<td>Stand-up Keynote e-Patient Dave</td>
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<tr>
<td>14:00</td>
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<td>Validating FHIR data with Structure-Definition 14:00 - 14:40</td>
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<td>The Howard</td>
<td>From v2 to FHIR Messaging 14:00 - 14:40</td>
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<td>Nick Hatt</td>
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<tr>
<td>16:00</td>
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<td>Introduction to a heartfelt life 15:50 - 16:30</td>
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<td>16:30</td>
<td>The Howard</td>
<td>Grab a coffee and code 15:45 - 16:05</td>
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**The Kari, Kas, Meeting Units**

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<th>Time</th>
<th>Location</th>
<th>Event</th>
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<tr>
<td>13:30</td>
<td>The Kari</td>
<td>Student Team Presentations 13:45 - 15:30</td>
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<td>Kas</td>
<td>Synthea: massive FHIR data 14:00 - 14:40</td>
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<td>Jason Walonoski</td>
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<td>14:00</td>
<td>The Howard</td>
<td>Boiler rooms 14:00 - 14:40</td>
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<td>Grab a coffee and code 14:40 - 15:30</td>
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<td>Chair yoga 14:45 - 15:25</td>
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<td>The Howard</td>
<td>Startup Presentations 15:45 - 16:30</td>
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<td>Introduction to a heartfelt life 15:50 - 16:30</td>
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<td>Grab a coffee and code 15:45 - 16:05</td>
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<td>Machine Learning on FHIR</td>
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<td>Enable eSource Clinical Research Data in Drug Dev. using FHIR</td>
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<td>08:30</td>
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<td>09:00</td>
<td>The Louis</td>
<td>FHIR and Protobuf</td>
<td>Patrik Sundberg</td>
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<td>The Howard</td>
<td>A FHIR Server is like the Swiss knife in your FHIR architecture</td>
<td>Christian Knaap</td>
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<td>COFFEE BREAK</td>
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<td>10:30</td>
<td>The Louis</td>
<td>Patient-generated health data with consent</td>
<td>Mikael Rinnetmäki</td>
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<td>The Howard</td>
<td>FHIR Bulk Data API</td>
<td>Josh Mandel</td>
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<td>11:00</td>
<td>The Louis</td>
<td>Remote decision support with CDS Hooks</td>
<td>Josh Mandel</td>
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<td>FHIRPath</td>
<td>Ewout Kramer</td>
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<td>Implementing Care Plan templates</td>
<td>Ville Lindholm</td>
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<td>Kas</td>
<td>Community (Tooling)</td>
<td>Various speakers</td>
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<td>FHIR projects</td>
<td>Nikolai Ryzhikov, Andrew Marcus</td>
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<td>Flutter on FHIR</td>
<td>Stoyan Halkaliev</td>
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<td>The Howard</td>
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<td>12:00</td>
<td><strong>Hands-on</strong> 11:55 - 12:35</td>
<td><strong>Hands-on</strong> 11:55 - 12:35</td>
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<td><strong>LUNCH</strong> 12:35 - 13:30</td>
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<td><strong>Stand-up Keynote</strong> Arjen van Berkum</td>
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<td>14:00</td>
<td><strong>Hands-on</strong> 13:45 - 14:40</td>
<td>Pitfalls and best practices for applications running on FHIR 14:00 - 14:40 Jenni Syed</td>
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<tr>
<td>15:00</td>
<td><strong>FAREWELL DRINKS</strong> 15:00 - 16:00</td>
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<td><strong>Hands-on</strong> 11:55 - 12:35</td>
<td><strong>FHIR projects</strong> 11:55 - 12:35 Marco Descher, Bram Wesselo</td>
<td><strong>Geeks Only Sessions</strong> 11:55 - 12:35 Speakers to be announced COMMUNITY</td>
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<td>14:00</td>
<td><strong>Clinical modelling and openEHR</strong> 14:00 - 14:40 Ian McNicoll</td>
<td><strong>Scalable Data Science with FHIR</strong> 14:00 - 14:40 Ryan Brush</td>
<td><strong>Geeks Only Sessions</strong> 14:00 - 14:40 Speakers to be announced <strong>MEDICAL RESEARCH</strong></td>
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### First Timers

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<th>Topic</th>
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<tr>
<td>07:45 - 08:15</td>
<td>Kas</td>
<td>Target audience: new attendees of FHIR DevDays</td>
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In this session, you will learn about the FHIR DevDays. The following items will be addressed: - Program: what is the set up? - Networking: how can you meet new colleagues with the same interest? - Hands-on sessions: when, what and where? - Exercises: what to expect? - Assistance: who can help?

### Google Cloud FHIR API

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Topic</th>
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</table>
| 08:30 - 08:45 | The Louis | Target audience: all participants  
Welcome to HL7 FHIR DevDays in Amsterdam! Ewout will open this 5th edition. |

### FHIR4 and what comes after

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Topic</th>
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<tbody>
<tr>
<td>09:00 - 09:40</td>
<td>The Kari</td>
<td>Target audience: This tutorial is intended for developers seeking to import batch or real-time FHIR data into cloud storage; developers can use the data for both transactions (e.g. EHR integration or SMART apps) as well as analyses (reporting, machine learning, etc). This tutorial will provide a guided tour of the Google Cloud FHIR API including setup, tools used for importing and processing data, and connecting FHIR data to BigQuery and TensorFlow. For data import, this tutorial will illustrate how ETL (extract-transform-load) tools convert data into FHIR. This talk will further demonstrate mechanics of the FHIR API, connecting the FHIR API with an application to serve as a FHIR back-end, and exporting data to analysis and machine learning services.</td>
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### Introduction to FHIR

<table>
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<tr>
<th>Time</th>
<th>Speaker</th>
<th>Topic</th>
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</table>
| 09:00 - 09:40 | Kas      | Track: IHE  
Type: Tutorial  
Target audience: Software / app developers, Analysts, Integration Specialists  
This tutorial will be focused on the IHE use of FHIR resources to enable API access to Document Sharing infrastructures based on XDS and XCA IHE profiles. These sharing platforms are diffused in many regions around the world. These sharing platforms are used by many local, regional, national and cross-border projects. The Document Sharing environment provides a way for Clinical Practitioners or patients to publish documents (e.g. CDA, C-CDA, DICOM, PDF, etc) such as medical summary, episode of care, discharge summary, laboratory results, x-ray, CT, MRI, and more. The IHE MHD Profile defines how FHIR enabled apps can discover these documents, retrieve them, and publish new documents. Advanced IHE Profile work will discuss how these documents could be decomposed into FHIR Resources that are more naturally made available, with Provenance linkage back to the source document from which the FHIR Resource information comes. |

### Building a FHIR client with HAPI and .NET (1)

<table>
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<tr>
<th>Time</th>
<th>Speaker</th>
<th>Topic</th>
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</table>
| 10:15 - 10:55 | The Howard | Target audience: Developers, Clinicians  
One language. One healthcare API. We use Javascript and FHIR on the client, server, database, testing, tooling, and hardware. Spend less time fighting with technology, and more time on clinical scenarios, bioinformatics, and helping patients. Join us for a short introduction on how to get started. |

### Conclusion

This tutorial covers several parts of the API. Code examples will be provided for creating resource instances, sending requests to servers and inspecting the responses. After this tutorial, you will be able to participate in the beginners track at the hackathon. Join James and Mirjam after this session for the guided hands-on session, where you will build your first FHIR client, using what you’ve just learned.
### Questionnaires / Structured Data Capture

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Time</th>
<th>Track</th>
<th>Audience</th>
<th>Session Title</th>
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</thead>
<tbody>
<tr>
<td>LLOYD MCKENZIE</td>
<td>10:15 - 10:55</td>
<td>Medical Research</td>
<td>Beginner</td>
<td>Building a FHIR client with HAPI and .NET (2)</td>
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**Speaker:** JAMES AGNEW  
**Time:** 11:05 - 11:45  
**Track:** Developers  
**Type:** Tutorial  
**Target audience:** Developers, Analysts, Architects

### Building a FHIR client with HAPI and .NET (2)

**Speaker:** JAMES AGNEW  
**Time:** 11:05 - 11:45  
**Track:** Developers  
**Type:** Tutorial  
**Target audience:** Developers, Analysts, Architects

This session will introduce the how the clinical research process works, from hypothesis to analysis, assess where FHIR can play a role, share our experiences with integrating two FHIRs into an online EDC tool (Castor EDC) via FHIR and we will do a hands-on mapping of FHIR resources to support clinical notes.

### SMART on FHIR

<table>
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<tr>
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<th>Time</th>
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<th>Audience</th>
<th>Session Title</th>
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<tbody>
<tr>
<td>JOSH MANDEL</td>
<td>11:05 - 11:45</td>
<td>The Louis</td>
<td>Beginners</td>
<td>Terminology and Terminology Services</td>
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**Speaker:** SEBASTIAAN KNUJENBURG  
**Time:** 11:05 - 11:45  
**Track:** Medical Research  
**Type:** Tutorial  
**Target audience:** Information architects, researchers, data managers  
**Level audience:** Beginners and experts

Electronic Data Capture (EDC) in clinical trials has been a manual, time consuming and error-prone task. Automated data entry via EHR linkage can greatly improve the efficiency of research personnel, improve the quality of the collected data and reduce the costs. As FHIR adoption in hospitals and EHRs rises, the EHR becomes a valuable data source for EDC tools. Data standardization and mapping from FHIR resource to research questions are required, but often hard to achieve.

In this session we will introduce the how the clinical research process works, from hypothesis to analysis, assess where FHIR can play a role, share our experiences with integrating two FHIRs into an online EDC tool (Castor EDC) via FHIR and we will do a hands-on mapping of FHIR resources to support clinical notes.

### Scheduling

<table>
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<tr>
<th>Speaker</th>
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<tbody>
<tr>
<td>RENE SPRONK</td>
<td>11:05 - 11:45</td>
<td>The Kari</td>
<td>Beginners</td>
<td>Extending Vonk FHIR server</td>
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**Speaker:** RUSS HAMM  
**Time:** 11:55 - 12:35  
**Track:** Developers  
**Type:** Tutorial  
**Target audience:** Developers, Architects

This tutorial will introduce the fundamentals of terminologies and value sets and how these are used by health care applications and FHIR. We will also introduce terminology services and describe how terminology services are used to support terminology use in applications.

### Clinical Notes

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<td>MICHELLE MILLER</td>
<td>11:55 - 12:35</td>
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<td>Birds of a feather sessions (BoFs) / Geek Only Sessions / Boiler rooms</td>
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**Speaker:** CHRISTIAAN KNAAP  
**Time:** 11:55 - 12:35  
**Track:** Developers  
**Type:** Tutorial  
**Target audience:** Developers, Architects

This tutorial will introduce you to our Profiling Academy and address profiling in practice. We will provide you with guidelines, best-practices and tips and tricks that you can take home for your own profiling project. We will also give some examples of real use cases.

**Speaker:** LILIAN MINNE  
**Time:** 11:55 - 12:35  
**Track:** FHIR for Modelers  
**Type:** Tutorial  
**Target audience:** Specifiers

In this tutorial we will introduce you to our Profiling Academy and address profiling in practice. We will provide you with guidelines, best-practices and tips and tricks that you can take home for your own profiling project. We will also give some examples of real use cases.
### Sessions | Wednesday 14 November

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<td>Russ Hamm</td>
<td>Security in FHIR - think like a hacker</td>
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**Searching in FHIR resources**

**Track:** Developers  
**Type:** Tutorial  
**Target audience:** Developers

Since the beginning of FHIR, there existed an official way for searching in FHIR resources. Using a RESTful API, specific information can be requested in a fine-granular way from a FHIR server. This tutorial will help you understand the FHIR Search Framework by covering the following aspects:  
- Introduction to using search parameters  
- Overview of available search parameter types and modifiers  
- How to create custom search parameters  
- Advanced search concepts like Reverse Chaining and filter expressions

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**FHIR profiling - overview and introduction**

**Track:** FHIR for Modelers  
**Type:** Tutorial  
**Target audience:** Specifiers

This tutorial will cover the following topics:  
- Overview of the FHIR Conformance layer  
- Introduction into authoring and publishing FHIR profiles and implementation guides  
- Demonstration of FHIR profiling tools: Forge, Simplifier

---

**FHIR in Microsoft Azure**

**Track:** FHIR in the Cloud  
**Type:** Tutorial  
**Target audience:** Developers, Architects

This tutorial will provide an overview of tooling and infrastructure for provisioning FHIR based environments in Microsoft Azure. Specifically, the focus will be on how platform services such as managed databases, application hosting environments, and API management can facilitate the deployment of production grade, compliant environments for FHIR services. The use of platform services reduces the operations and management overhead while ensuring compliance. Deployment in a feature rich cloud environment enables users and developers to leverage other platform services for analytics and visualization. The tutorial will point to specific templates and automation tools for deploying open source and Azure native FHIR tools.

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**Security in FHIR - think like a hacker**

**Target audience:** Developers, Architects, Business Stakeholders  
**Level audience:** Both FHIR experts and novices

During this tutorial you will learn to “think like a hacker”. Asymmetrik, the recent winners of the ONC Secure FHIR Server Challenge, will discuss security in the context of FHIR servers and applications. The speaker will cover basic security best practices. The corresponding hands-on session includes a capture-the-flag type challenge.

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**Introducing to a Heartful Life**

**Track:** Chair Yoga  
**Type:** Tutorial  
**Target audience:** All

We sit too much and move too little. This is creating tension and pain in our body. That is why yoga at work is evolving fast. Yoga creates space in your body, so body fluids can regenerate the tissues and joints and keep them healthy.

During this short class you will learn a short sequence of movements you can do daily at your office. These yoga poses will help you increase your focus, enhance productivity and body awareness and release feelings of stress. By doing this you reduce the risk of RSI and burnout.

---

**Deploying FHIR data in AWS**

**Track:** FHIR in the Cloud  
**Type:** Tutorial  
**Target audience:** Interoperability developers

In this session, learn how to build a serverless interface for FHIR on AWS using the Amazon API Gateway and AWS Lambda. Learn the common framework for building and deploying such interfaces and how to operate them for production use. Core concepts for serverless computing will be introduced as well as a sample GitHub repository for production use. Core concepts for serverless computing will be introduced as well as a sample GitHub repository.

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**How to build a FHIR server with HAPI**

**Track:** Developers  
**Type:** Tutorial  
**Target audience:** This tutorial is intended for developers with a working understanding of Java, Java Servlets, and Apache Maven.

This tutorial is intended for developers with a working understanding of Java, Java Servlets, and Apache Maven. This tutorial will focus on the use of terminologies and terminology services in support of FHIR domain resources.

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**Terminology on FHIR**

**Track:** Imaging  
**Type:** Tutorial  
**Target audience:** Analysts, Developers, Architects

This tutorial will focus on the use of terminologies and terminology services in support of FHIR domain resources.

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**Lightning Talks**

**Track:** | Track: Chair Yoga  
**Type:** | **Target audience:** all attendees

A number of short presentations by DevDays participants on any topic. Five minutes max, that is 300 seconds and not a second longer. Grab the attention of the audience, that’s the only thing that matters. Other than no abusive talks on stage please.

Talk about your own hilarious digital healthcare experience, about litter in Amsterdam, the Dutch tulip rage compared to the FHIR hype, why developers are considered nerds and why that’s a wrong characterization, beer or bikes or beer and bikes, the weather in the Netherlands.
GraphQL, FHIR and Javascript

ROBERT WINTERBOTTOM
09:00 - 09:40 | The Louis
Track: Developers
Type: Tutorial
Target audience: Developers, Specifiers
Level audience: Both FHIR experts and novices

GraphQL is a powerful new paradigm for building advanced APIs. It is built on a strongly typed data model, which not only allows the client to specify which fields to return, but also allows for deep introspection of data models and parameters. This has enabled a rich ecosystem of client and server libraries, including UIs for navigating the data model. In this talk, the speaker will introduce GraphQL, explain how it fits into the FHIR ecosystem, and demonstrate how Asymmetrik built an extensible, secure FHIR server around an existing GraphQL javascript server library.

FHIR Proficiency certification prep

SIMONE HECKMANN
09:00 - 09:40 | The Howard
Track: Certification
Type: Tutorial
Target audience: Experienced FHIR developers/specifiers who aim for professional certification of their skills or FHIR Beginners who are willing to dive deep into the specification with the purpose of achieving certification.

The Tutorial will inform participants about the requirements for taking the HL7 FHIR Proficiency Exam. We will take a quick look over the topics that are covered by the exam, give tips for how to prepare and test your knowledge with a few training questions, so you can decide whether you’re ready to take the exam or need more time to study.

Order management and Results reporting

RENE SPRONK
10:15 - 10:55 | The Louis
Track: EHR
Type: Tutorial
Target audience: those new to the order management functional domain; prerequisite for this tutorial is some basic knowledge of FHIR

This tutorial demonstrates how to build a FHIR Implementation Guide (IG) using the IG editor of Simplifier.net and the FHIR build tool. The exercises in the hands-on time will provide the opportunity to create your own IG with guidance of the speakers.

Building apps for EHR Store

ABIGAIL WATSON
10:15 - 10:55 | The Howard
Track: Apps
Type: Tutorial
Target audience: Developers, Business Stakeholders

Join us for a discussion of what it takes to get software released into an App Store. We will discuss business structures, liabilities concerns, legal compliance, hosting requirements, estimated costs, capacity planning, data storage, data interoperability, and security and authorization protocols. We will talk the nitty-gritty of fetching data via OAuth and FHIR, how to store the data once you’ve got it, and how to stand up algorithms and services as business offerings. We’ll also talk about the submission process, and what to expect when people start scrutinizing your application.

Implementation Guide (IG) Tooling

LLOYD MCKENZIE ARDON TOONSTRA
10:15 - 10:55 | The Kari
Track: FHIR for modelers
Type: Tutorial
Target Audience: Specifiers

This tutorial will provide the opportunity to create your own IG with guidance of the speakers.

New FHIR resources for Pharma Industry

RIK SMITHIES
10:15 - 10:55 | Kas
Track: Miscellaneous
Type: Tutorial
Target audience: Anyone wanting to know what is new in FHIR, but particularly anyone involved in the pharma industry or those with a medication business offering. No technical knowledge of FHIR is assumed.

New resources in FHIR cover the needs of the pharmaceutical industry and regulatory bodies (such as EMA, FDA). These allied health domains need to cover medicinal products to a much greater detail than for direct patient care, including legal approvals, details of ingredients, substances, packaging, manufacturers etc. The FHIR resources have similar coverage to the ISO IDMP logical models for products and substances (ISO 11615, 11238). They also have application in drug knowledge databases that can provide prescribing decision support, with coverage of drug interactions, contraindications etc. The tutorial gives an overview of this healthcare domain and the draft resources.

FHIR testing and system certification

RICHARD ETTEMA
11:05 - 11:45 | The Louis
Track: FHIR Testing
Type: Tutorial
Target audience: FHIR implementers (developers) and testers (QA/QC) and anyone interested in FHIR testing.

This tutorial will review the FHIR Testing Framework and how the Touchstone Testing Platform implements this framework and supports certification programs. We will examine the Nictiz MedMij FHIR Implementation Support and Qualification program in Touchstone.

During the Grab a coffee and code sessions, stop by the FHIR Testing table where we have hands-on exercises that: get you started with Touchstone execution and review of your first TestScripts - explore various test scenarios with basic FHIR operations and aspects - examine the process of taking a test case definition to a functional TestScript - review the publicly available Nictiz MedMij testing suites in Touchstone’s Nictiz FHIR Sandbox.
FHIRCast is a specification aiming at making it easier to implement desktop synchronization between systems of different vendors. It builds on standard web technologies such as RESTful services, WebSub and WebSockets to communicate the context of a healthcare system's user-facing clients to FHIR resources on other systems subscribed to these changes. To jump-start new developers, there is a sandbox utility as a reference implementation of the FHIRcast specification. The specification and the sandbox will be the focus of this talk. Read more at http://fhircast.org.

This session consists of 2 community presentations, which focus on the implementation best practices of their project/product. These presentations are NOT a product showcase - the aim is to have max. 5 minutes to introduce a product/project, followed by a deep dive in things like the architectural approach, tools used, good/bad experiences with FHIR. The aim is for software implementers (even if they’re not using the same architecture nor development platform) to learn from the development approach as used in other projects.

1. Creating an event management service using HL7 FHIR
   Anthony Koukes, InterSystems
   Tony will present a summary of the journey taken to implement an event management service using HL7 FHIR in response to the need to know where every child is and how healthy they are. He'll describe the use case, the design of a publish / subscribe architecture that makes use of the FHIR Subscription and profiled message Bundle resources, OAuth 2.0, the tools and software stack used for the development and deployment.

2. FHIR-aware template engine
   Dunmail Hodkinson, Blackpeary
   Dunmail will demonstrate how they combined the Handlebars template engine with FHIRpath to provide a FHIR-aware template engine that can be used to generate web-pages and documents. As software engineers we use shared libraries to simplify development. This includes FHIR libraries and other packages supporting specific capability such as web-servers and transformations. This presentation shows how we combined these packages to accelerate the rate at which we can deliver software.

Birds of a feather sessions (BoFs) / Geek Only Sessions / Boiler rooms
Check the website and the announcement screens for all ad-hoc sessions.

FHIR projects

ANTONY BEUKES

DUNMAIL HODKINSON

11:05 - 11:45 | Kas

Track: EHR
Type: Presentations
Target audience: Developers

This session consists of 2 community presentations, which focus on the implementation best practices of their project/product. These presentations are NOT a product showcase - the aim is to have max. 5 minutes to introduce a product/project, followed by a deep dive in things like the architectural approach, tools used, good/bad experiences with FHIR. The aim is for software implementers (even if they’re not using the same architecture nor development platform) to learn from the development approach as used in other projects.

1. Australia’s FHIR-based National Clinical Terminology Service (NCTS)
   John Grimes, CSIRO
   The NCTS launched two years ago as one of the first production implementations of FHIR. The NCTS incorporates a FHIR server that implements the Terminology Services API and SNOMED CT areas of the FHIR specification, as well as a syndication mechanism for automating the download of terminology releases. Since the initial launch, it has also been migrated from DSTU2.1 to STU3, with R4 compatibility under development. John will present an overview of the technical architecture of the NCTS, as well as a retrospective look at some alternate ways that the functionality of this system could be implemented, if reimagined today.

2. Implementing a referral flow in FHIR
   Ruben Pape, ZorgDomein
   Last year ZorgDomein launched a new interface to facilitate data exchange for referrals between healthcare providers. In this presentation ZorgDomein will discuss the implementation choices made to exchange and secure the data, e.g. through the implementation of FHIR documents, mutual SSL and JSON web tokens. Furthermore the challenges of implementing non-final and moving FHIR standards in a production setting will be discussed.
From v2 to FHIR Messaging

**NICK HATT**
14:00 - 14:40 | The Howard

- **Track:** Developers
- **Type:** Tutorial
- **Target audience:** App developers, health system interface analysts

Are you working with EHR vendors that have only have HL7v2 interfaces and no FHIR roadmap in sight? Nick will present principles that Redox has learned in developing v2 to FHIR. The soup-to-nuts presentation will take you from an existing v2 interface to publishing a FHIR implementation guide for it. No v2 experience is expected.

Synthea: massive FHIR data

**JASON WALONOSKI**
14:00 - 14:40 | Kas

- **Track:** Developers
- **Type:** Tutorial
- **Target audience:** Software Developers, Data Analysts, Educators

This tutorial and exercise will introduce and walk through the generation of synthetic data for your next software development, integration, connectathon, or analytics task. The session will highlight Synthea ("Synthetic Health"), an open-source software package that generates synthetic patient records. The software models and simulates over 500 clinical concepts, with a growing list of community written modules. You will learn how to configure and run the simulation (including localization), how to use the resulting data (including pre-generated datasets), and how to explore and modify the existing modules.

Chair Yoga

**MARIKEN FLIERVOET**
14:45 - 15:25 | Chalet 1

- **Target audience:** All

We sit too much and move too little. This is creating tension and pain in our body. That is why yoga at work is evolving fast. Yoga creates space in your body, so body fluids can regenerate the tissues and joints and keep them healthy.

During this short class you will learn a short sequence of movements you can do daily at your office. These yoga poses will help you increase your focus, enhance productivity and body awareness and release feelings of stress. By doing this you reduce the risk of RSI and burnout.

Stand-up Keynote Martin Woodward

**MARTIN WOODWARD**
15:30 - 15:45 | The Louis

- **Target audience:** all attendees

Train your focus and intuition by developing your awareness. Becoming aware of your different states of being, you can have more control over your emotions and create a higher level of focus, inner peace and a feeling of well-being.

In this introduction you will learn to observe your awareness, how you are living and how to reduce stress or negative feelings. Train your mind to be in the moment and focus.

Introduction to a heartful life

**MARIKEN FLIERVOET**
15:50-16:30 | Chalet 1

- **Target audience:** All

Train your focus and intuition by developing your awareness. Becoming aware of your different states of being, you can have more control over your emotions and create a higher level of focus, inner peace and a feeling of well-being.

In this introduction you will learn to observe your awareness, how you are living and how to reduce stress or negative feelings. Train your mind to be in the moment and focus.

Birds of a feather sessions (BoFs) / Geek Only Sessions / Boiler rooms

Check the website and the announcement screens for all ad-hoc sessions.

Startup Presentations

15:45 - 16:30 | The Kari

**Target audience:** Startups

Come and listen to their presentations!

The Startup Track is sponsored by Conclusion

- **Target audience:** all attendees

synthesize products to the audience before heading out to the social night out in Amsterdam.

Enable eSource Clinical Research Data in Drug Development using FHIR

**MICHELE CHERRY**
16:05 - 16:45 | Kas

- **Track:** Clinical Research
- **Type:** Tutorial
- **Target audience:** Developers interested in applications development and other opportunities in using FHIR to support clinical research using data sourced from EHR/EMRs, devices and apps

This tutorial will review recent work by the TransCelerate BioPharma Consortium (19 member pharmaceutical companies), including use cases for applying FHIR in clinical studies. Focusing on the use of EHR/EMRs along with devices, sensors, and mobile applications as transformational enablers for clinical research, pharmaceutical companies’ ultimate goal is move beyond point to point integrations (i.e., national level networks) to interoperable and scalable solutions. The session will review scenarios for research explored at recent FHIR Connectathons, including use of FHIR ResearchStudy and ResearchSubject resources, collection of EHR and lab data for use in clinical research databases, as well as explore more advanced topics such as protocol integration.

- **Target audience:** all delegates

Announcement and awards for the winners of the Student Track and the Startup Track. The winners will pitch their products to the audience before heading out to the social night out in Amsterdam.

Machine Learning on FHIR

**PATRIK SUNDBERG**
16:05 - 16:45 | The Louis

- **Track:** Developers
- **Type:** Tutorial
- **Target audience:** analysts, developers (intermedi- ate users)

This talk describes how to use machine learning to make predictions over data encoded in FHIR, using Google’s open-sourced tools. It will describe how to generate examples and labels, how to train and run the provided model architectures, as well as how to build and evaluate new models of your own.
FHIR Server that will host all the resources you need.

- Looking for a generic back end for your apps? Deploy a FHIR Server.
- Do you have that legacy system that just won’t go away? Restyle it as a FHIR Server.
- fi les and let a FHIR Server check them on your data.
- Data quality hard to maintain? State your rules as profiles, and let the FHIR Server enforce the IG as a bonus.
- Has your region started data exchange in FHIR? Setup an FHIR Server as your integration point to the project, and let it manage the transfer of patients.
- Do you want to support your researchers? Use it as a common back end that can be accessed by all researchers.

FHIR architecture

- Do you want to support your researchers? Use it as a Clinical Data Repository.
- Has your region started data exchange in FHIR? Setup an FHIR Server as your integration point to the project, and have it enforce the IG as a bonus.
- Data quality hard to maintain? State your rules as profiles, and let the FHIR Server check them on your data.
- Do you have that legacy system that just won’t go away and won’t integrate either? Use a FHIR Server as a facade on top of it and have it speak FHIR.
- Looking for a generic back end for your apps? Deploy a FHIR Server that will host all the resources you need.

Christiaan will explain what a FHIR Server actually is and how we’ve represented FHIR in proto format, with a focus on how this representation simplifies working with extensions and profiles.

Internally at Google, we use Protocol Buffers to work with FHIR. We’ve open-sourced many of the tools that power our work, in the hope that they will be as useful to the larger community as they are to us. This talk describes how we’ve represented FHIR in proto format, with a focus on how this representation simplifies working with extensions and profiles.

A FHIR Server is like the Swiss knife in your FHIR architecture

Flutter on FHIR

Flutter is Google’s mobile app SDK for creating beautiful high-quality native apps on iOS and Android in record time. In this talk, you will learn about Flutter and the Dart language, how to convert FHIR resources to Dart classes and how to automate the process. You will be shown the Flutter-FHIR-App generator, which takes a FHIR-Profile and generates a complete functioning Flutter app for Android and iOS. Finally, a short summary how all this can be helpful with regulatory requirements when developing health software (acc. IEC62304), computer systems validation (acc. ISO13485) and Software as Medical Device (SaMD).

Packets and Versioning

Flutter on FHIR

STOYAN HALKALIEV

09:00 - 09:40 | The Howard

Track: Developers
Type: Tutorial
Target audience: App Developers, Product Managers, Product Owners

This talk introduces the FHIR Bulk Data API, which provides a way to query for records across an entire population of patients at once. We’ll review use cases and motivation for bulk data transfer; the asynchronous request pattern for initiating an export; the security protocols for backend services authentication; and the current state of spec development. We will demonstrate resources including a FHIR Bulk Data reference implementation (client and server).

4. Progressive Web App for rendering FHIR questionnaires

Daniel Zsebedics, Molit

This tool is capable of rendering FHIR questionnaires and capturing the responses as a QuestionnaireResponse resource. The chosen implementation as a progressive web app enables the usage of this tool on mobile devices and the desktop.
Remote decision support with CDS Hooks

JOSH MANDEL
11:05 - 11:45 | The Louis

Track: EHR
Type: Tutorial
Target audience: Anyone building SMART apps or decision support services

CDS Hooks is an emerging standard that leverages both FHIR and SMART to provide open and interoperable decision support in the EHR. Using CDS Hooks, you can provide guidance to the clinician such as a better medication to order, critical information about the patient, or push a SMART app that should be run. This presentation will provide you with an overview of CDS Hooks, how it aligns with existing HL7 efforts and standards, and what the future holds.

FHIRPath

EWOUT KRAMER
11:05 - 11:45 | The Kari

Track: FHIR for Modelers
Type: Tutorial
Target audience: Profile authors, modelers

FHIRPath is a path traversal and extraction language much like XPath. It is used – amongst other things – for validation of instances. Learn about its syntax and structure so you can author FHIRPath expressions with confidence.

Birds of a feather sessions (BoFs) / Geek Only Sessions / Boiler rooms
Check the website and the announcement screens for all ad-hoc sessions.

FHIR projects

NIKOLAI RYZHIKOV
ANDREW MARCUS
11:05 - 11:25 | Kas

Track: Community
Type: Presentations
Target audience: Developers

1. System to system integration with FHIR
Nikolai Ryzhikov, Health Samurai
The REST API is good for client-server interaction, where client exists for quite a short span and syncs it state from a server. Scenarios which require the use of a distributed network of FHIR servers are much more challenging: e.g. intercommunication between servers and data aggregation from multiple different sources. Nikolai will provide an overview of existing FHIR features which can help to build system-system integration, and he’ll explain a proposal for a FHIR transaction log based on REST and the Kafka API. This approach has number of interesting properties for integration and can be easily implemented for existing FHIR servers and clients.

2. Expanding an App to support different FHIR servers
Andrew Marcus, Asymetrik
Suppose you’ve built a SMART-on-FHIR app that works with one particular EMR; scaling up to support a second or third EMR is not as simple as just configuring a few new endpoints. The FHIR ecosystem still relies completely on point-to-point integrations between individual client apps and individual server environments. Andrew will introduce Cardiac Consultant, an app built for use with the Cerner EMR, and review the challenges he faced in expanding this solution to support different FHIR servers. He’ll discuss some of the pain points of building a truly portable FHIR app, and demonstrate how FHIR facade servers can be used as middleware to simplify the development of portable apps.

Stand-up Keynote Arjen van Berkum

ARJEN VAN BERKUM
13:30 - 13:45 | The Louis
Type: Plenary
Target audience: all attendees

The moral compass of a bot
Arjen is considered the disruption evangelist. If we can automate everything and AI is all over the place, the important question is how to automate our moral compass.

Pitfalls and best practices for applications running on FHIR

JENNI SYED
14:00 - 14:40 | The Howard
Track: Apps
Type: Tutorial
Target audience: Developers creating applications against a FHIR server
Level audience: (also) useful for FHIR beginners

Learn how to avoid some of the common issues we’ve seen in applications in the wild when they’re first starting development against a FHIR server. This will include examples from Cerner’s public sandbox, but the issues and troubleshooting tips provided are applicable for any application consuming FHIR.
Clinical modelling and openEHR

IAN MCNICOLL

14:00 - 14:40 | The Kari

Track: FHIR for modelers
Type: Tutorial

This session will be useful for those wishing to understand how openEHR and FHIR differ in scope and purpose but can be usefully and easily combined. Detailed technical knowledge is not required.

This session will present an overview of the openEHR ecosystem, the central principles of clinical data repositories (CDRs) and clinician-driven modelling. We will explore the differences in approach/intent between openEHR and FHIR, and show how and where they can both be used as part of a strategic approach to eHealth systems development, based on practical examples of models, tools and code. We will take time to discuss prospects for future joint efforts on modelling and tooling.

Scalable Data Science with FHIR

RYAN BRUSH

14:00 - 14:40 | Kas

Track: Medical Research
Type: Tutorial

Target audience: intermediate audience interested in deep exploration and analysis of large FHIR datasets.

As healthcare datasets grow, so do the challenges of exploring and analyzing them. This tutorial looks at how FHIR can help even with petabyte-size datasets by natively encoding FHIR resources in popular tools for data science at scale. Attendees will use interactive Jupyter Notebooks and the Apache Spark processing engine to explore such data in an efficient, columnar format. Participants will work through data engineering and analysis examples and touch on machine learning. These examples are based on Bunsen, an open source project to simplify analyzing FHIR with tools like Apache Spark.

Prerequisites
For the best experience in this tutorial, attendees are encouraged to have Docker installed on their machines and run the following command to install the Docker image with the data science environment we will use: docker pull cerner/bunsen-notebook

Wrap up HL7 FHIR DevDays

GRAHAME GRIEVE

14:45 - 15:00 | The Louis

Type: Plenary

Target audience: all attendees

The Wrap up summarizes DevDays, and looks across the entire FHIR community development process to provide guests with a discussion of the opportunities the community has.

Farewell drinks

15:00 - 16:00 | Atrium

Target audience: all attendees
Making FHIR even simpler
Products, services and training by the people who run FHIR DevDays.

Firely’s FHIR products help you make a headstart with HL7® FHIR® and manage your FHIR interoperability projects.

- **SIMPLIFIER.NET**
  Simplifier.net is the FHIR collaboration platform. Upload, manage and share FHIR profiles and Implementation Guides.
- **FORGE**
  Forge is the official FHIR tool for managing conformance resources ("FHIR Profiles"). Free download.
- **VONK**
  VONK is the .NET FHIR Server for production purposes.
- **FHIR-API**
  The official .NET API for FHIR. Available on GitHub and NuGet.
HL7® FHIR® DEV DAYS USA 2019

SAVE THE DATE
June 10 – 12, Redmond, WA
Microsoft campus

HL7® FHIR® DEV DAYS 2019

SAVE THE DATE
Nov 20 – 22, Amsterdam
FHIR Server for Azure

https://github.com/Microsoft/fhir-server
Open. Extensible. Easy to deploy.
Check it out and contribute!

Get €170 in Azure credits and 12 months of popular services

aka.ms/fhirserver-azurefree
See you in 2019!

HL7® FHIR® DevDays
Microsoft campus
Redmond, WA
June 10 - 12 2019

HL7® FHIR® DevDays
Amsterdam
Nov 20 - 22 2019

www.fhirdevdays.com