

# Laboratory Test Ordering on FHIR

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November 20-22, Amsterdam | @HL7 @FirelyTeam | #fhirdevdays | [www.devdays.com](http://www.devdays.com)

# How can someone order lab tests in Russia?

- Different types of consumers
  - Medical organizations
  - Labs
  - People who would like to make a lab test without a referral

# What do customers want?

- Catalog of available lab tests
- Specimen types for tests
- Which observations will be returned for lab tests?
- Estimated time of accomplishment (delays)
- Observations required for correct reference ranges
- Guidelines about preanalytics calculation
- Make requests
- Receive results

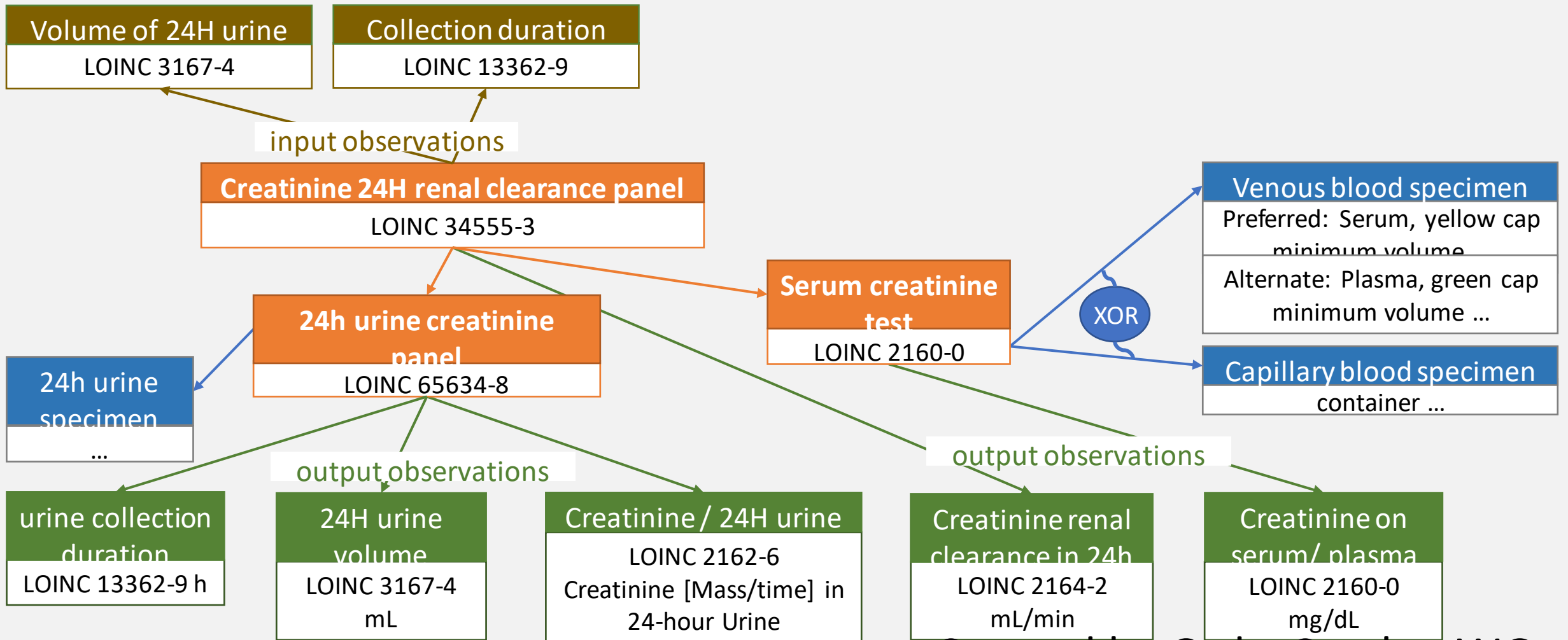
# What can be expressed in HL7 FHIR R4?

Requirement	FHIR Resources
Catalog	Composition, CatalogEntry, PlanDefinition
Specimens for lab tests	ActivityDefinition, SpecimenDefinition
Observation for lab tests	ActivityDefinition, ObservationDefinition
Estimated time of accomplishment	?
Observations required for correct reference ranges	ActivityDefinition, ObservationDefinition
Guidelines on preanalytics calculation	?
Make requests	ServiceRequest, Task, Specimen, Observation, Patient
Receive results	DiagnosticReport, Observation

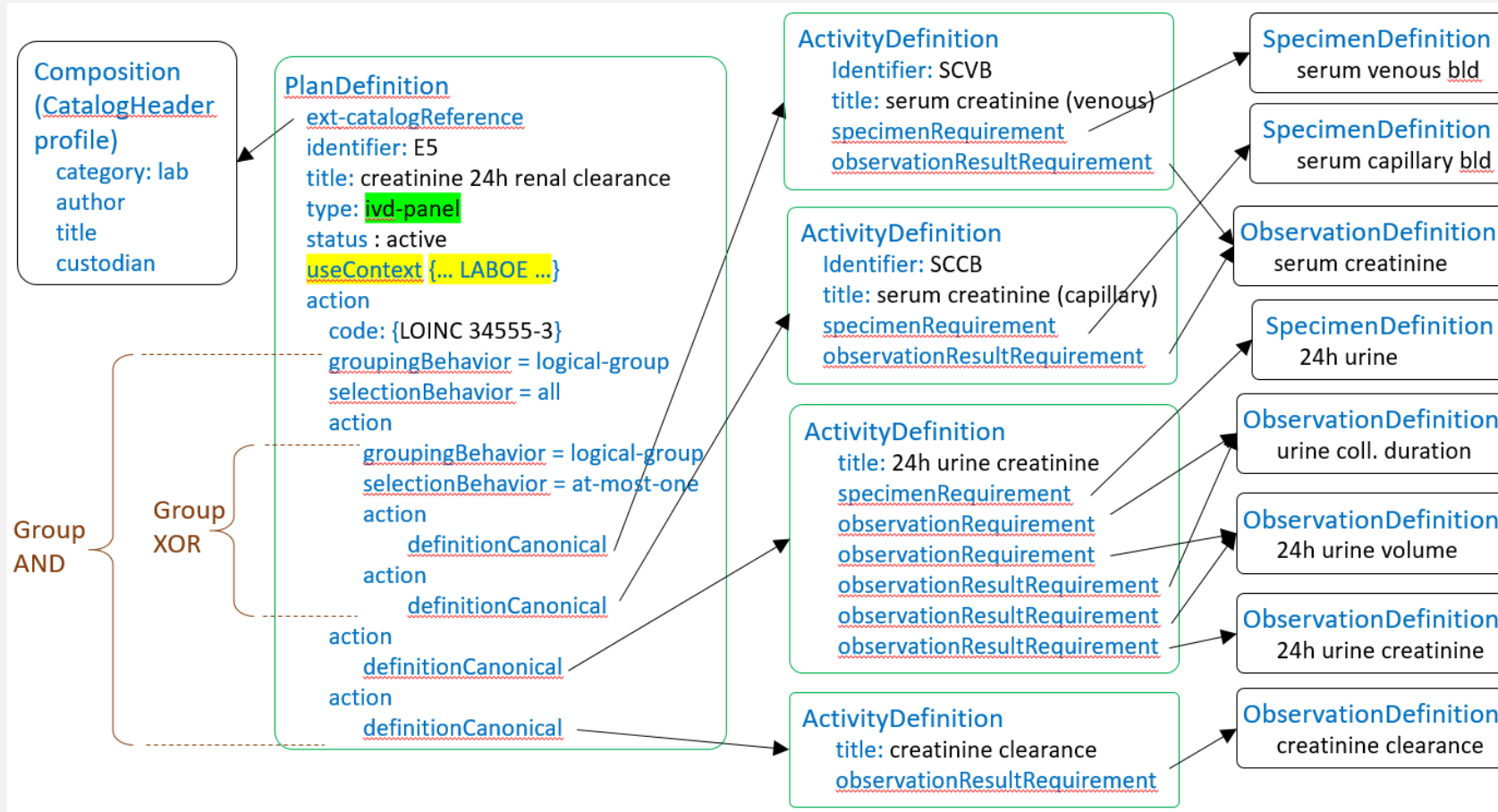
# Catalog

- Catalog resources are not mature enough in R4
- A lot of interest from different organizations in different countries:
  - Phast (France)
  - University of Utah
  - Quest Diagnostics (US laboratory)
  - LabCorp (US laboratory)
  - Medlinx (Russia)
  - Helix (Russian laboratory)

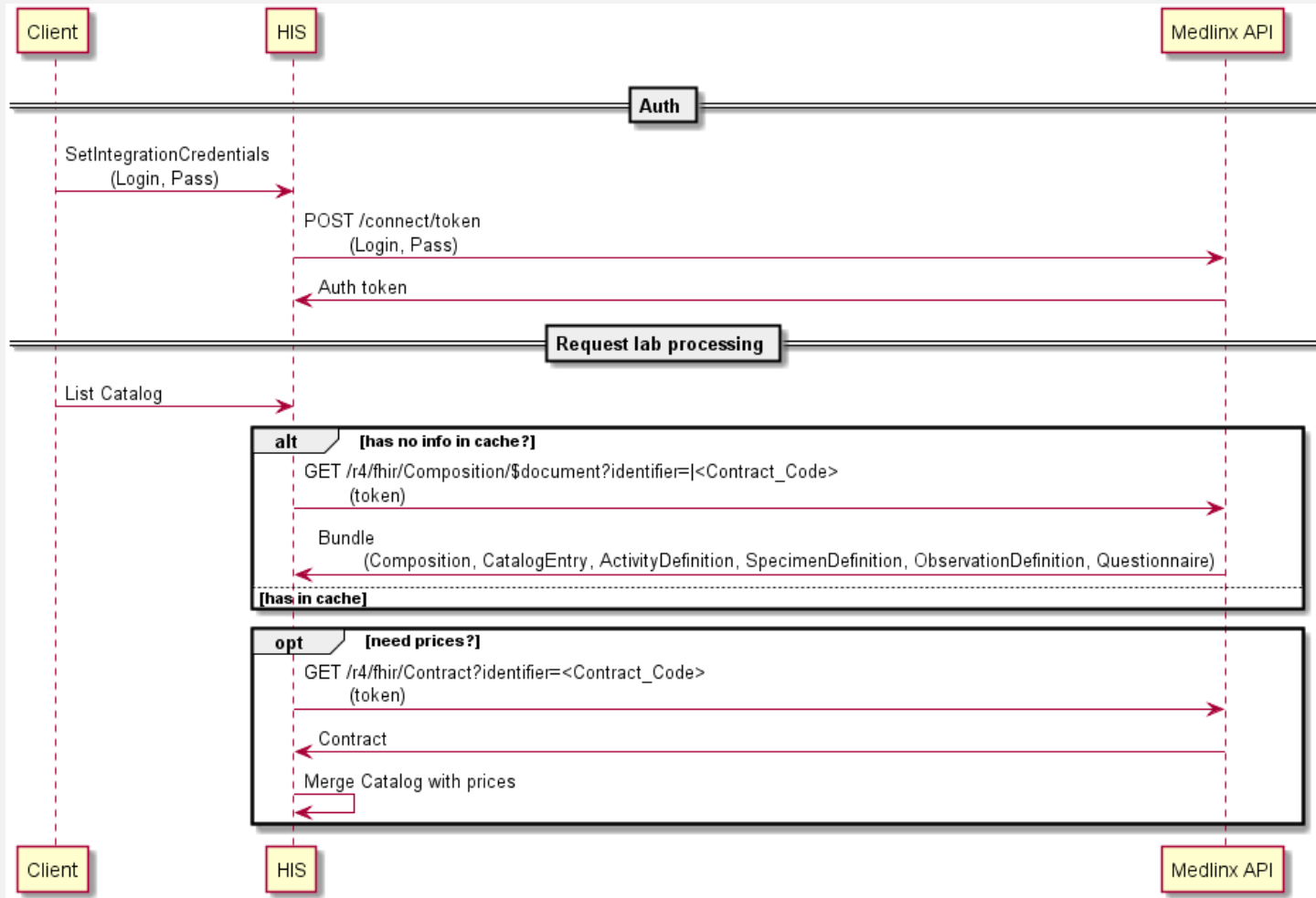
# Catalog



# Catalog



# Sequence chart





# Estimated time of accomplishment

- No standard way to do
- We use two extensions for CatalogEntry
  - <https://api.medlinx.online/extension/eta-status>
  - <https://api.medlinx.online/extension/eta-delay-duration>

Value	Description
available	Lab test available for order
delayed	Lab test available for order but will be delayed
stopped	Lab test can't be performed by the laboratory

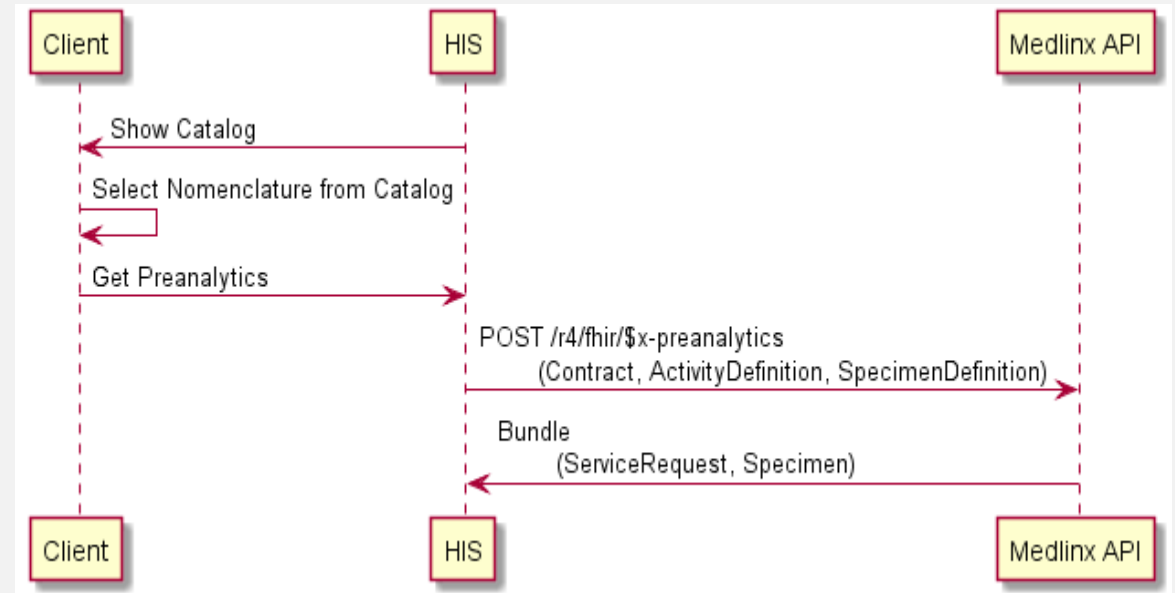
# Estimated time of accomplishment in HL7 FHIR R5

- CatalogEntry
  - estimatedDuration field

note	0..*	Annotation	Notes and comments about this catalog entry
estimatedDuration	0..1	Duration	Estimated duration of the orderable item
billingCode	$\Sigma$ 0..*	CodeableConcept	Billing code in the context of this catalog entry <a href="#">All CPT codes (Example)</a>
billingSummary	$\Sigma$ 0..1	string	Billing summary in the context of this catalog entry
scheduleSummary	0..1	string	Schedule summary for the catalog entry
limitationSummary	0..1	string	Summary of limitations for the catalog entry
regulatorySummary	0..1	string	Regulatory summary for the catalog entry

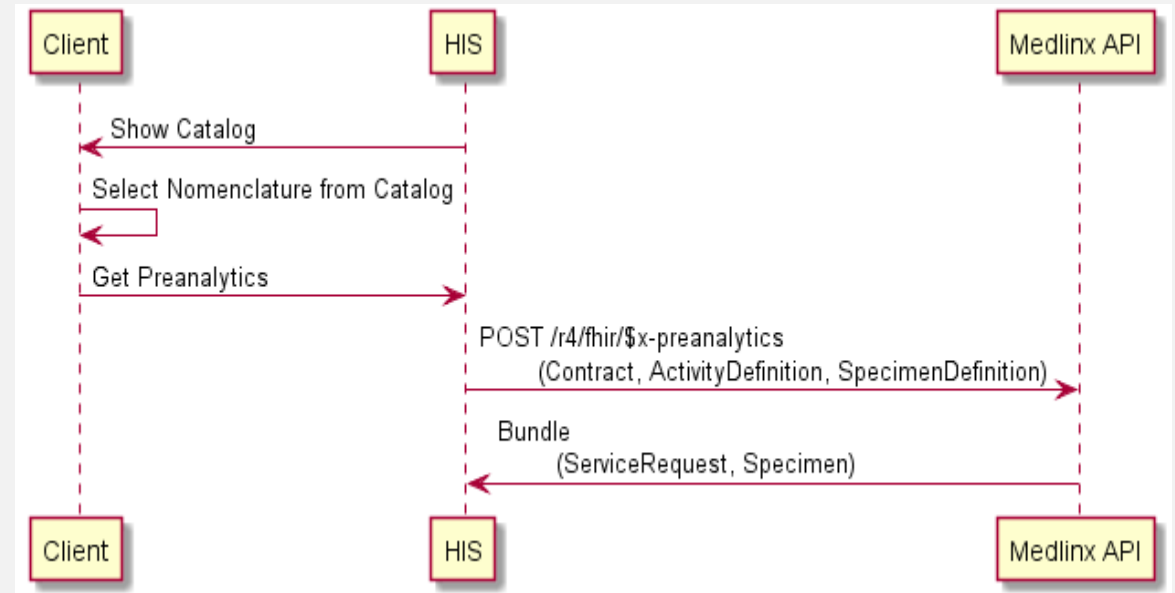
# Preanalytics

- What do we call preanalytics phase of lab testing:
  - how to handle specimens
  - which specimens can be taken into one container
- The laboratory provides the textbook with guidelines
- We decided to provide API



# Preanalytics

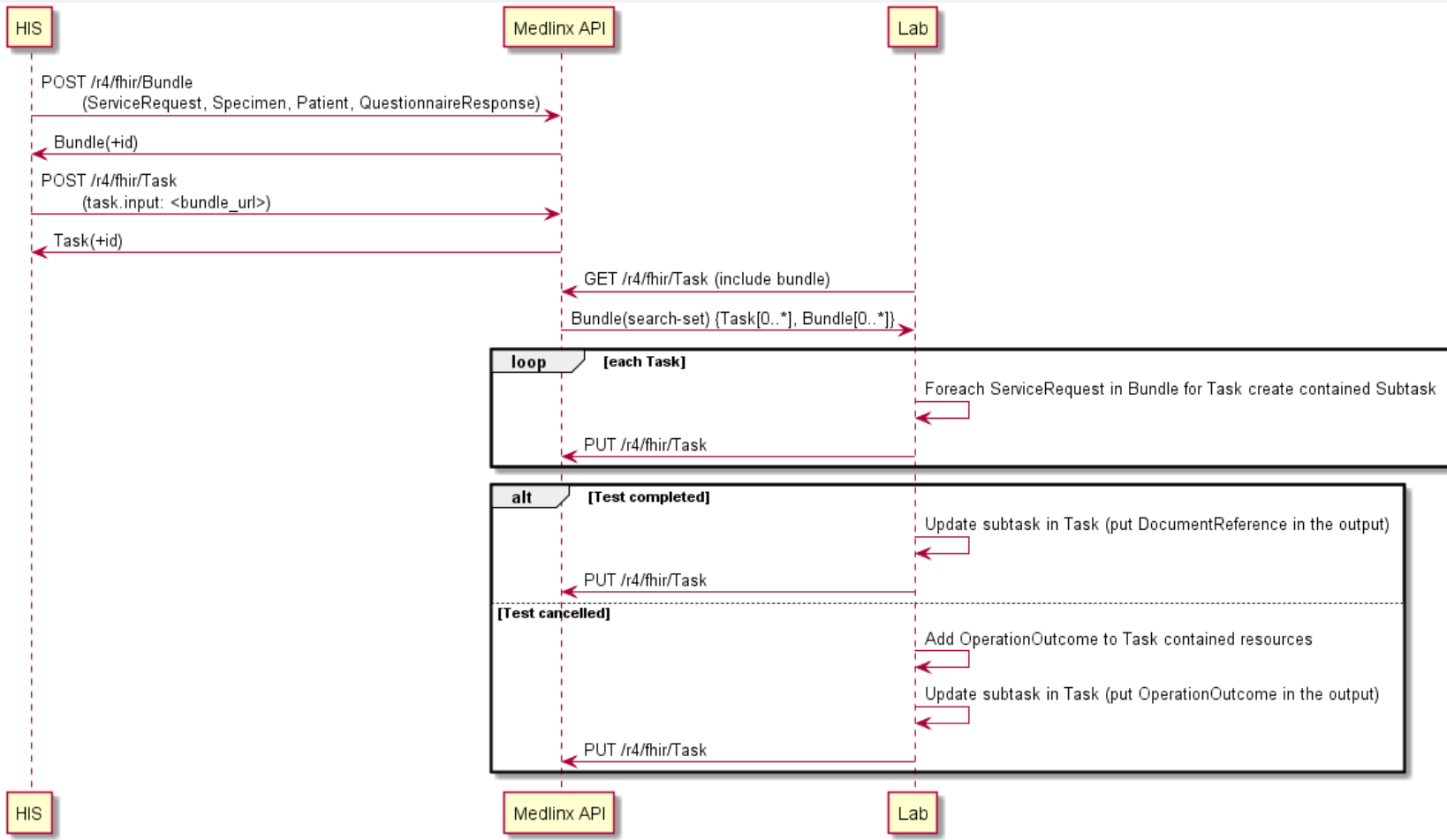
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# Order lab tests

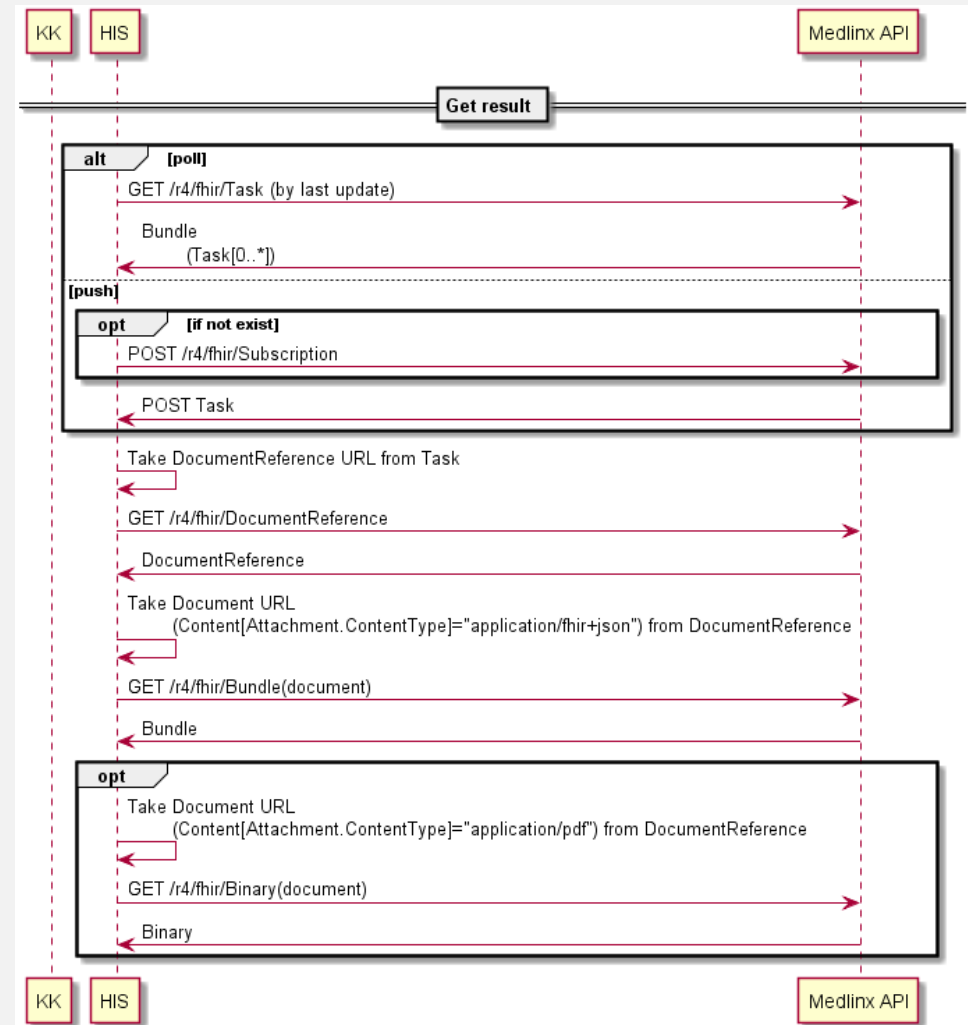
- Create separate resources
  - Basic FHIR workflow
  - Not easy for producer and consumer
- Create a bundle with all resources
  - Unusual FHIR workflow
  - Easy for workflow participants to exchange.
  - How to handle the status of requests inside the bundle?

# Order lab tests



# Lab test results

- We can't use separate Diagnostic reports and Observations in our workflow.
  - Documents
- We provide two ways to receive results
  - Polling
  - Notifications



# Summary

- We can build almost all types of interactions for lab testing with HL7 FHIR R4
- Some extensions can be part a of the standard in next release
- A lot of resources are not mature, use them on your own risk
- Sometimes it is easier to use custom workflow for API.



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