

FHIR Fagforum #7

Egde og sin erfaring med Smile CDR og
sky arkitektur

1 September 2021

Egde



Intro

- SmileCDR - erfaring
- Use Case 1 - i et **pasientoppfølgingsystem** for livsstilsendring og behandling av sykkelig overvekt
- Use case 2 - backend tjenester for **kontinuerlig langtids hjerteovervåkning**
- Erfaring med helseintegrasjonsplattform og knutepunkt i sky

evjeklinikken



SmileCDR

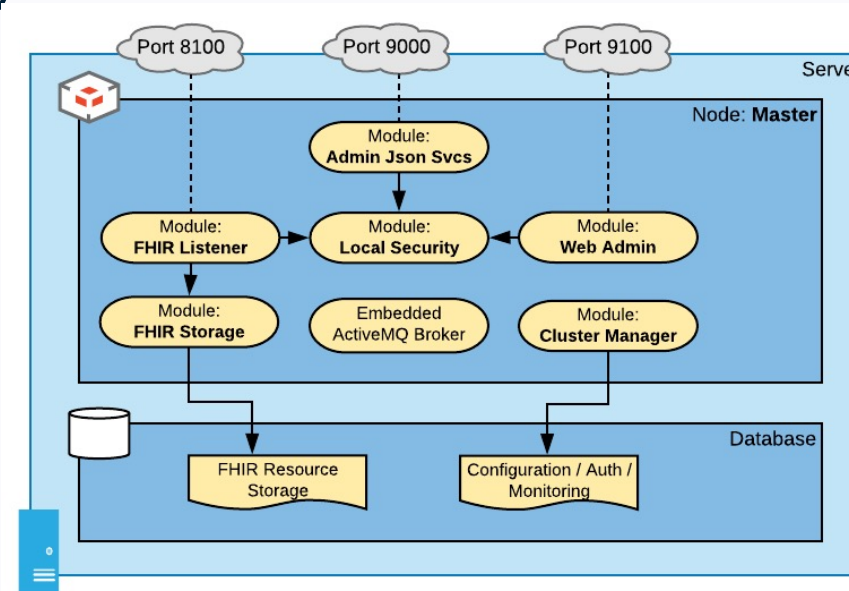
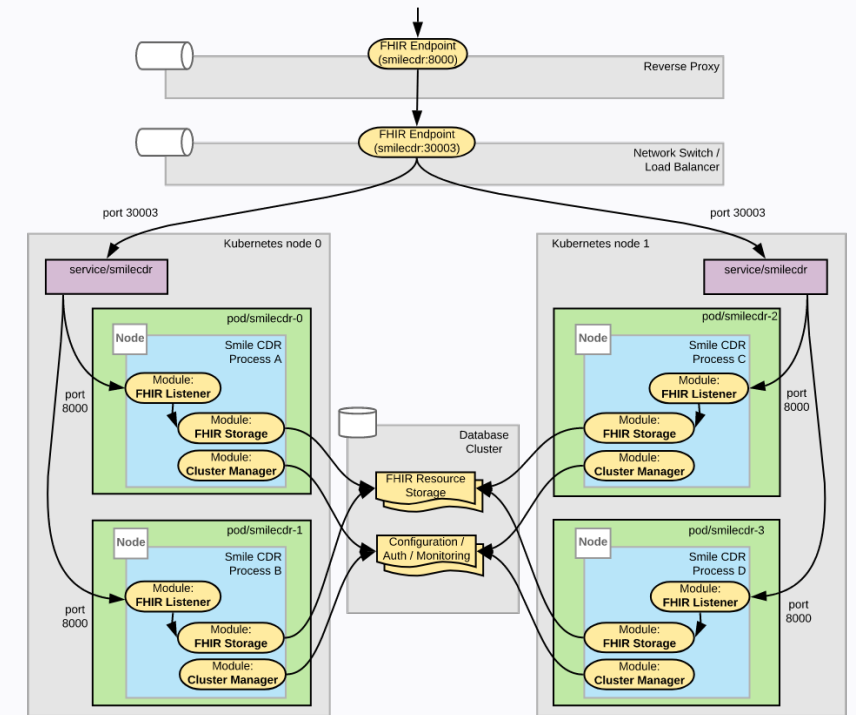
- Generisk FHIR Server
- Kommersiell løsning skapt med HAPI FHIR
- Java basert
- Core-basert pris modell
- DSTU2 og oppover
- Oppdateres hver tredje måned



smile CDR

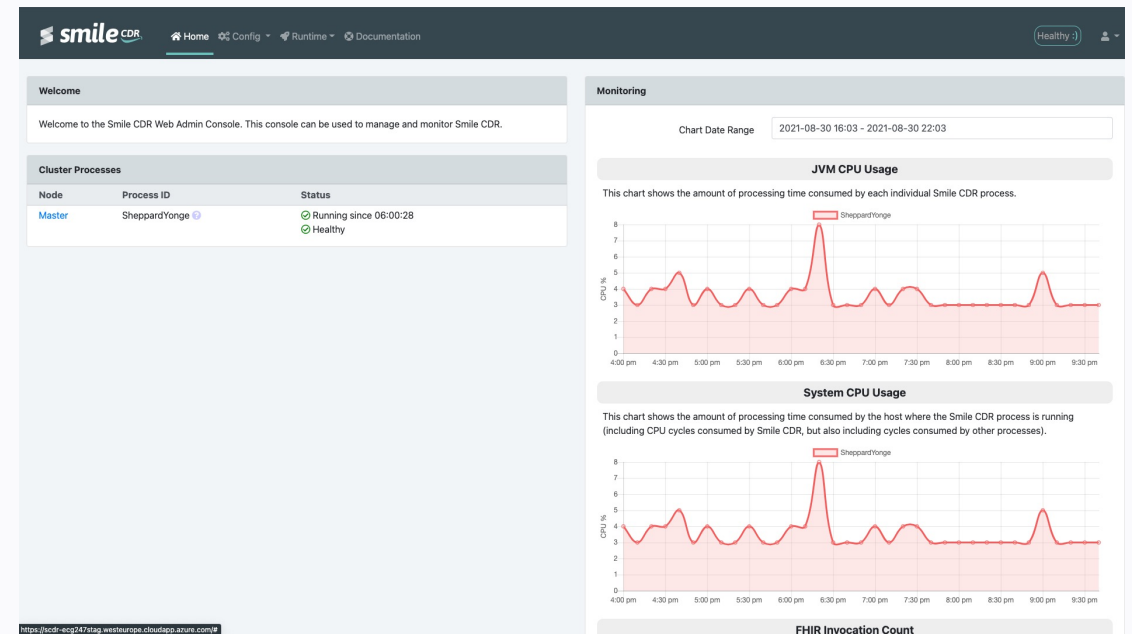
Arkitektur

- Noder
- Moduler
 - Listener
 - Storage
 - Inbound Security
- VM/Docker/Kubernetes/..



Features

- FHIR API
- Validasjon av profiler og terminologi
- Terminologi tjeneste
- Subscriptions
- Egne søkeparametre
- SMART on FHIR
- Ekstern IdP
- Audit logging
- Monitorering
- Plugins
- Scripts
- Etc, etc



The screenshot shows the 'Configuration' page in the Smile CDR Admin Console. It displays a list of modules for the 'Master' node, categorized into Cluster, Administrative Modules, FHIR Modules, and Security Modules. A dropdown menu is open, showing a list of available modules to be added to the node. The 'Add Module of Type' dropdown is currently set to 'CDA Exchange'. Below the list, there is a table showing the status of the installed modules.

Node ID	Module ID	Description	Status
Master	clustermgr	Cluster Manager	Running
Master	admin_json	JSON Admin API	Running
Master	admin_web	Web Admin Console	Running

Vi forener mennesker og teknologi

FHIR API og persistering

- By default, støtter hele base standard
- Søkparametre (_has, _revinclude, chained parameter)
- CRUD, vRead, Patch
- Støtte for relational og non-relational databaser i bunn

Validasjon og terminologi

- Validasjon
 - Repository eller endepunkt validasjon
 - Gjort med interceptors
 - Bruker referanse implementasjonen av FHIR validator
 - Utvikler egne regler
 - Importering av pakker (npm, IG)
- Terminologi
 - Støtter terminologi operasjoner
 - Importering av LOINC, SNOMED, ICD-10-CM og custom kode system

```
import ca.uhn.fhir.context.FhirContext;
import ca.uhn.fhir.interceptor.api.Interceptor;
import ca.uhn.fhir.jpa.interceptor.validation.RepositoryValidatingInterceptor;
import ca.uhn.fhir.jpa.interceptor.validation.RepositoryValidatingRuleBuilder;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.ApplicationContext;

import javax.annotation.PostConstruct;

/**
 * This interceptor is intended to be registered against a Smile CDR FHIR Storage module.
 */
@Interceptor
public class DemoRepositoryValidatingInterceptor extends RepositoryValidatingInterceptor {

    @Autowired
    private FhirContext myFhirContext;

    @Autowired
    private ApplicationContext myApplicationContext;

    /**
     * This method will be called at startup time
     */
    @PostConstruct
    public void start() {
        setFhirContext(myFhirContext);

        // Ask the application context for a new Rule Builder
        RepositoryValidatingRuleBuilder ruleBuilder =
myApplicationContext.getBean(RepositoryValidatingRuleBuilder.class);

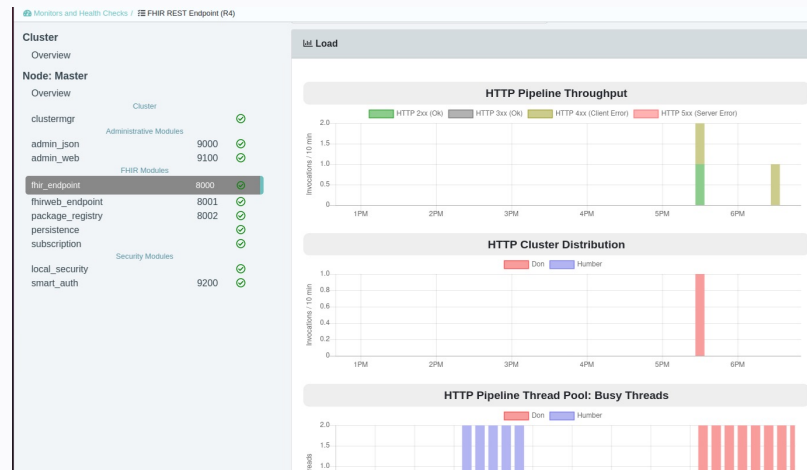
        // Here we will mandate only that any Patient resources stored in the repository
        // must declare conformance to the US Core profile, and must correctly validate.
        // You may add as many rules for as many resource types as you like here.
        ruleBuilder
            .forResourcesOfType("Patient")
            .requireAtLeastProfile("http://hl7.org/fhir/us/core/StructureDefinition/us-core-patient")
            .and()
            .requireValidationToDeclaredProfiles();

        // Resources of types other than Patient will not be subject to any rules by
        // this interceptor as it is, but more rules could be added here.

        // Create the ruleset and pass it to the interceptor
        setRules(ruleBuilder.build());
    }
}
```

Sikkerhet og monitorering

- User manager (RBAC)
- Audit logs, transaction logs, system logs
- Callback scripts
- 2FA
- Monitorering
- SMART on FHIR



	Module	Username	Family Name	Given Name	Last Active Date	2FA	Roles and Permissions	Flags
Modify	Node: Master Module: local_security	ADMIN	GenericUser	Admin	2021-08-31	No	Superuser	
Modify	Node: Master Module: local_security	ANONYMOUS	Anonymous	Anonymous	2021-08-31	No	FHIR Client (Superuser)	System User
Modify	Node: Master Module: local_security	OPERATOR			Never	No	FHIR Client (Read-Only Superuser) FHIR Terminology Service Read-Only Client	
Modify	Node: Master Module: local_security	SOMEГУY			Never	No		
Modify	Node: Master Module: local_security	TEST123			Never	No		Locked

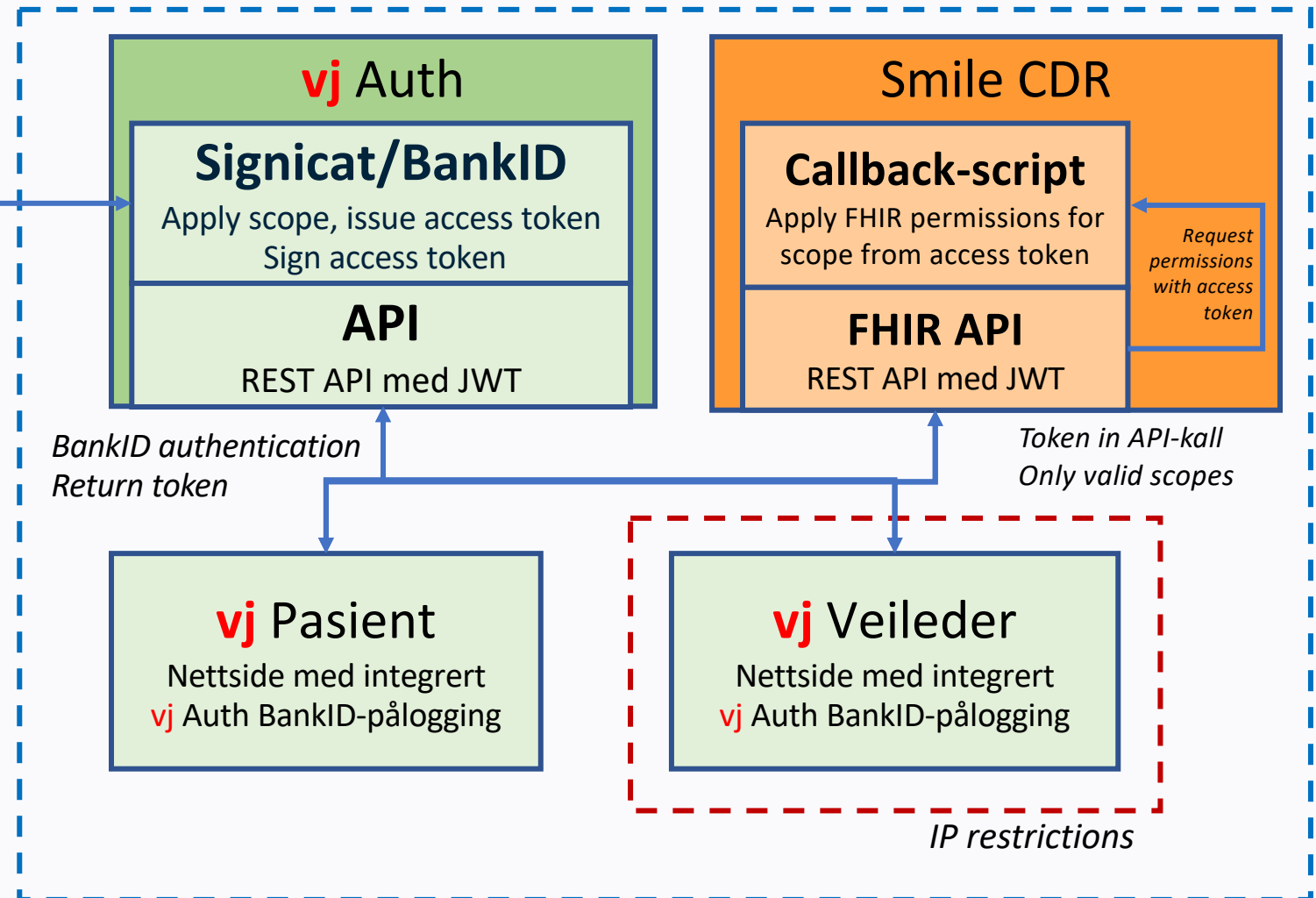
	Id	Date/Time	User	Client	Endpoint	Action
View	14405	2021-08-31 18:40:53	ADMIN (local_security) Admin GenericUser	Node: Master Module: admin_web		Create a new user
View	14404	2021-08-31 18:40:25	ADMIN (local_security) Admin GenericUser	Node: Master Module: admin_web		Create a new user
View	14403	2021-08-31 18:39:45	ADMIN (local_security) Admin GenericUser	Node: Master Module: admin_web		Create a new user
View	14402	2021-08-31 18:38:41	ADMIN (local_security) Admin GenericUser	Node: Master Module: admin_web		Log into the Web Admin Console

Use Case 1 - Pasientoppfølgingsystem

Signicat / BankID
Authenticate and issue token

FHIR-ressurser (bl.a.):

- Patient, Practitioner, PractitionerRole, CareTeam
- Observations, Goals
- QuestionnaireResponse
- Consent, AuditEvent



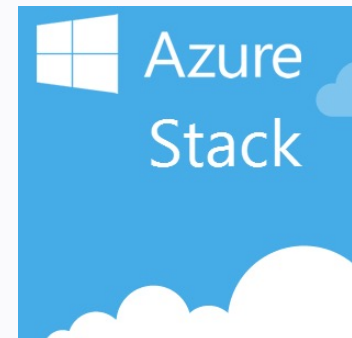
Use Case 2 - Kontinuerlig langtids hjerteovervågning (sensordata)

FHIR-ressurser (bl.a.):

- Patient
- Practitioner
- Procedure
- Observation
- DiagnosticReport
- DocumentReference

Bruk av FHIR i vårt integrasjonsknutepunkt

- Bruk av FHIR-server kjørende som container i Kubernetes
- Bruker per nå HAPI FHIR, Microsoft FHIR Server, evt. Kojin – ikke SmileCDR
- Kjører Kubernetes cluster i privat sky basert på Azure Stack
- Integrasjon mot VKP, NHN og journaler samt autentiseringstjenester



Vår erfaring med bruk av SmileCDR

Fordeler	Ulemper
Enkel installasjon	Monolittløsning
Administrasjonsgrensesnitt	Vanskelig å tilpasse
SMART on FHIR ut av boksen	Vanskelig å debugge
ElasticAPM integrert	Dyre og uflexible lisenser
Multitenant-funksjonalitet	Utfordrende å skalere
Audit-logg integrert	Vanskelig å tilpasse til containerløsning

<https://techpointconference.no/>



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Egde

Norges raskest voksende tech- og næringslivskonferanse

Techpoint 2021
Kilden teater og konserthus
Kristiansand, 22. – 23. september

Kjøp billetter →