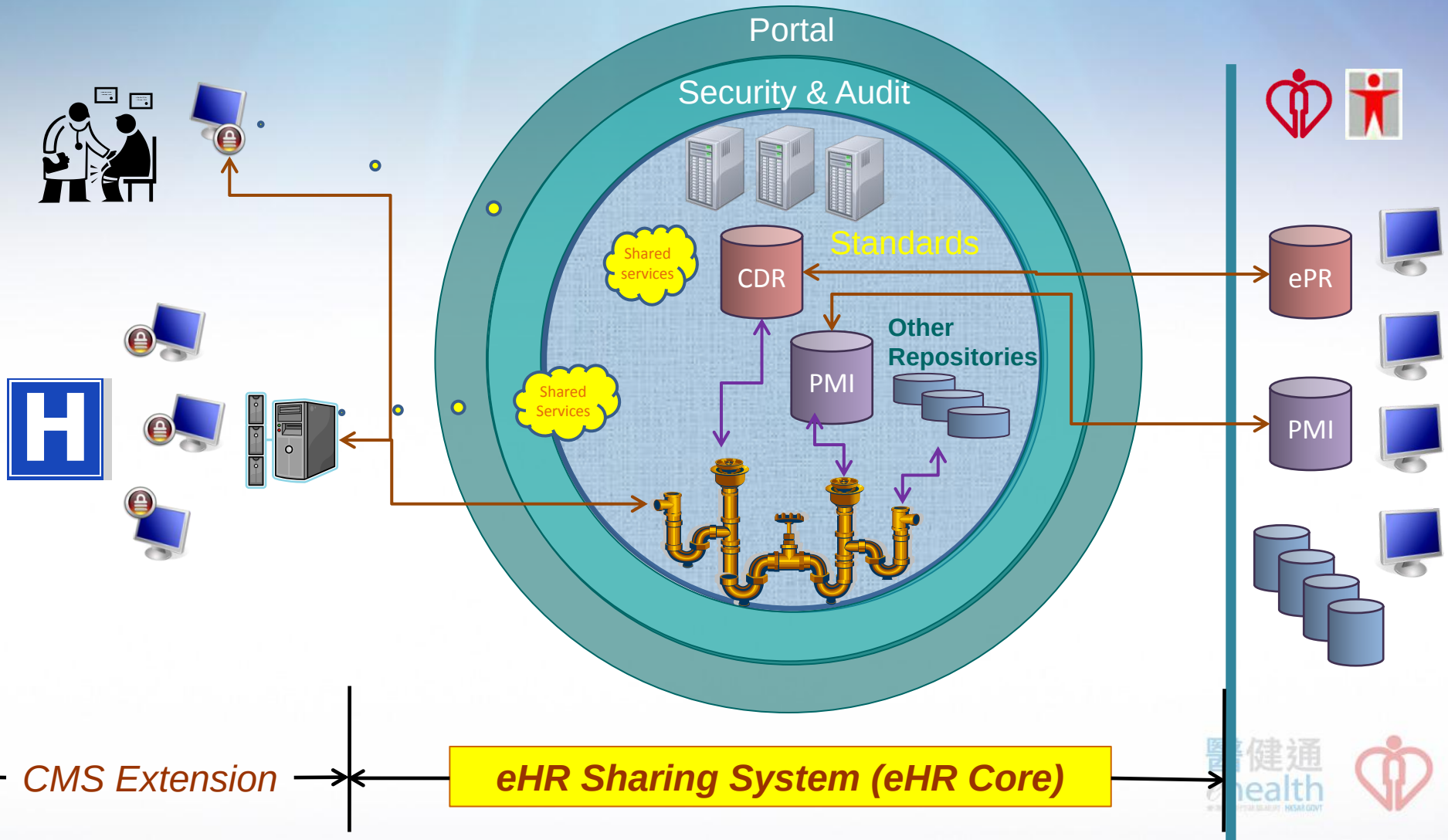
eHR Preparation – Technical Aspect

SSM(AI) eHR PMO

System Overview



eHR Sharing System

Serves as a **platform for sharing** the electronic Health Records of participants **securely** among healthcare providers

Technical Preparation

- Access to eHRSS
- Data interfaces to and from eHRSS

ACCESS TO EHRSS

Controlled Access to eHRSS

- Aim : Protect security and privacy of eHR data
- Can only connect to the eHRSS through 'Identifiable Sources':
  - Fixed IP address; or
  - Installed eHR Encapsulated Linkage Security Application (ELSA)
- To be able to view the eHR clinical data
  - HCP must have joined eHR
  - Patient must have joined eHR
  - Patient has given consent to the HCP
- User Access controlled by Role-based access control

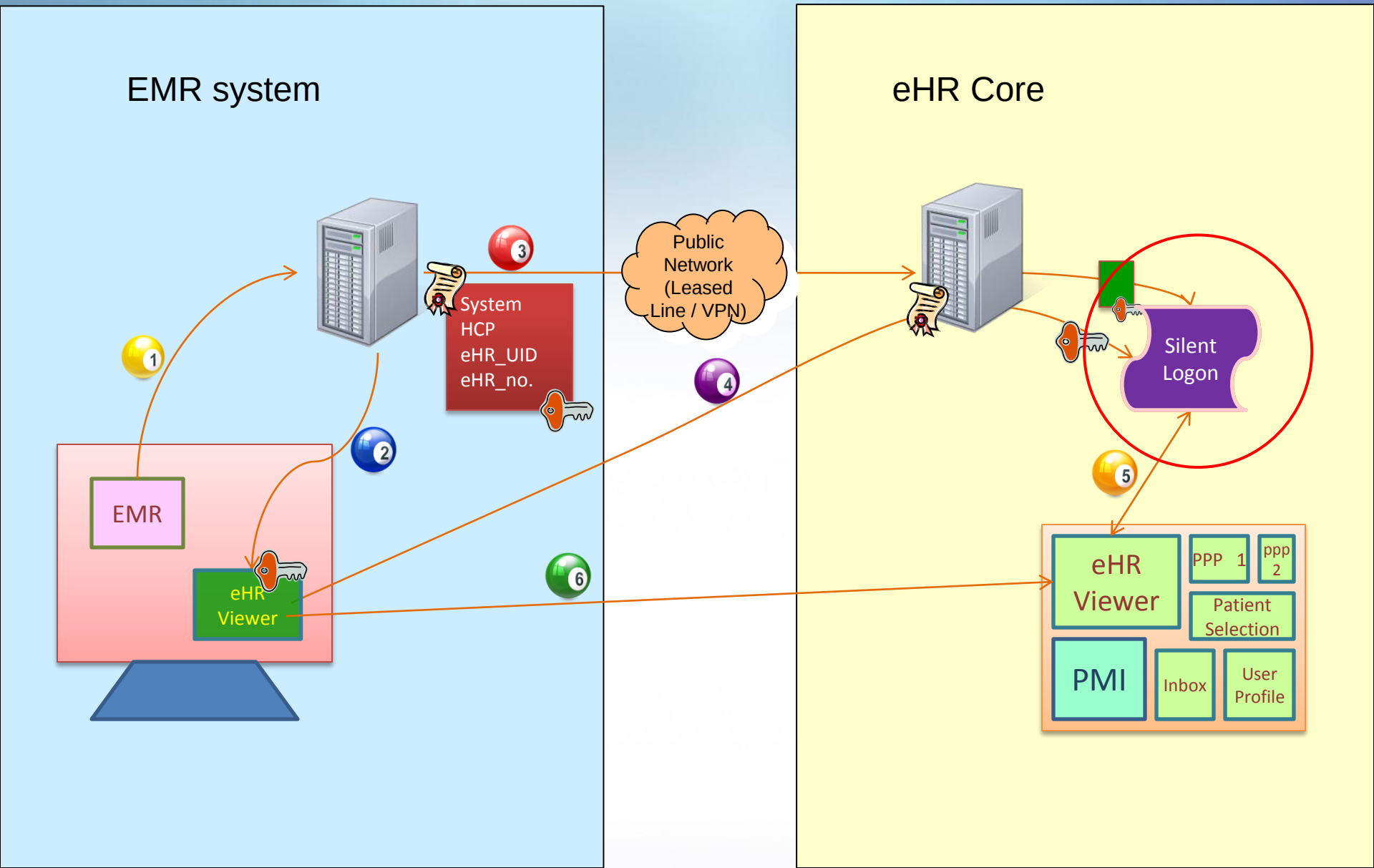
Identifiable sources :

Connection Modes

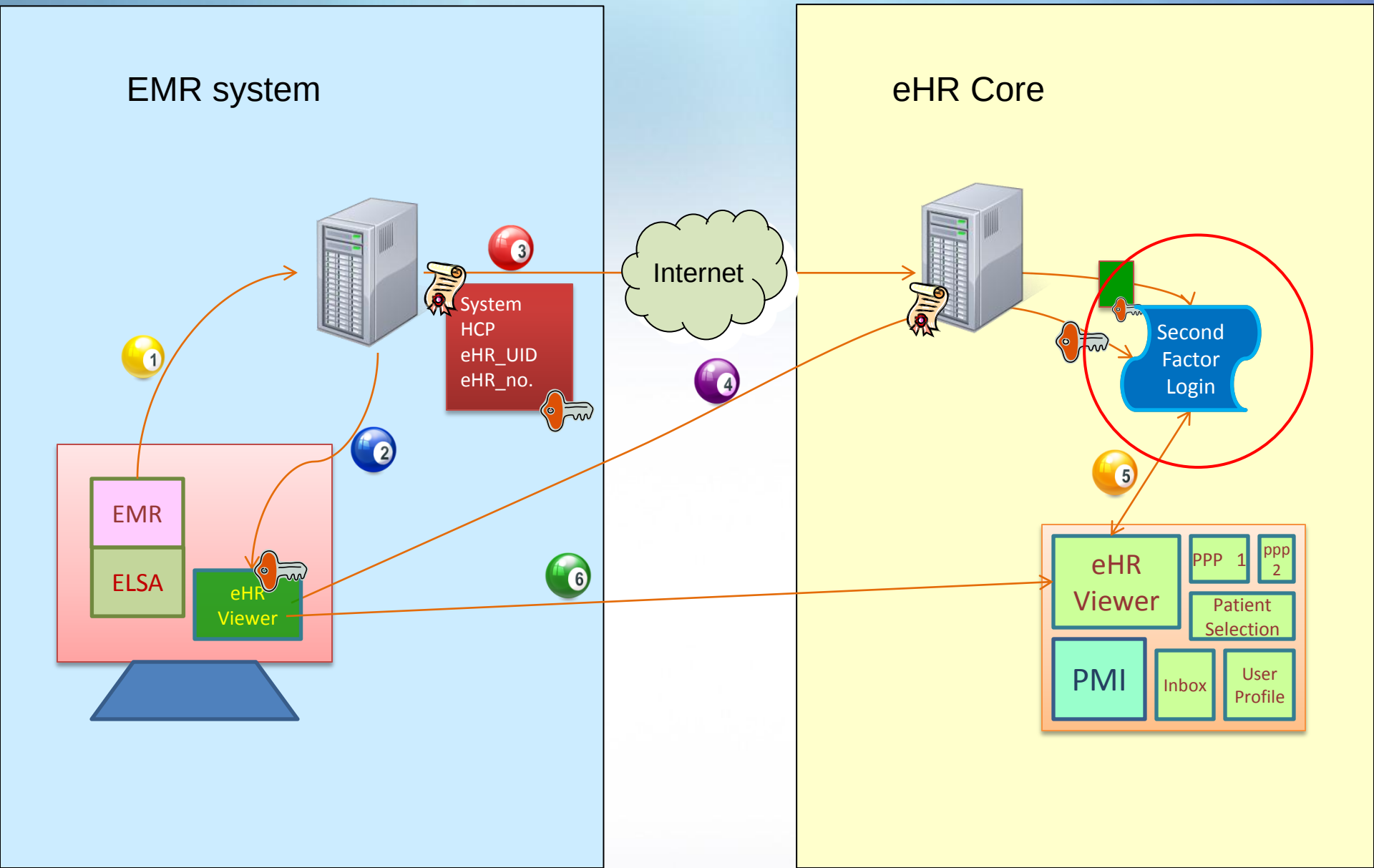
eHR Connection Modes

Mode		Certified EMR	Connect via	Sub Mode	Source Identification	User Authentication			Type of 2nd Factor	User Exper-ience
						Login ID	Password	2nd Factor		
A	System based Private Channel Connection	Yes	Leased line/VPN	1.0	Fixed IP	Local	Local	eHR	E-Cert (Server based enciphe rment)	Silent Logon
B	System based Public Channel Connection	Yes	Internet	2.0	ELSA	Local	Local	eHR	User elect	2nd Factor Logon
				3.0	Fixed IP					
C	Workstation based Public Channel Connection	No		4.0	ELSA	eHR	eHR	eHR	User elect	Full 2FA Logon
				5.0	Fixed IP					

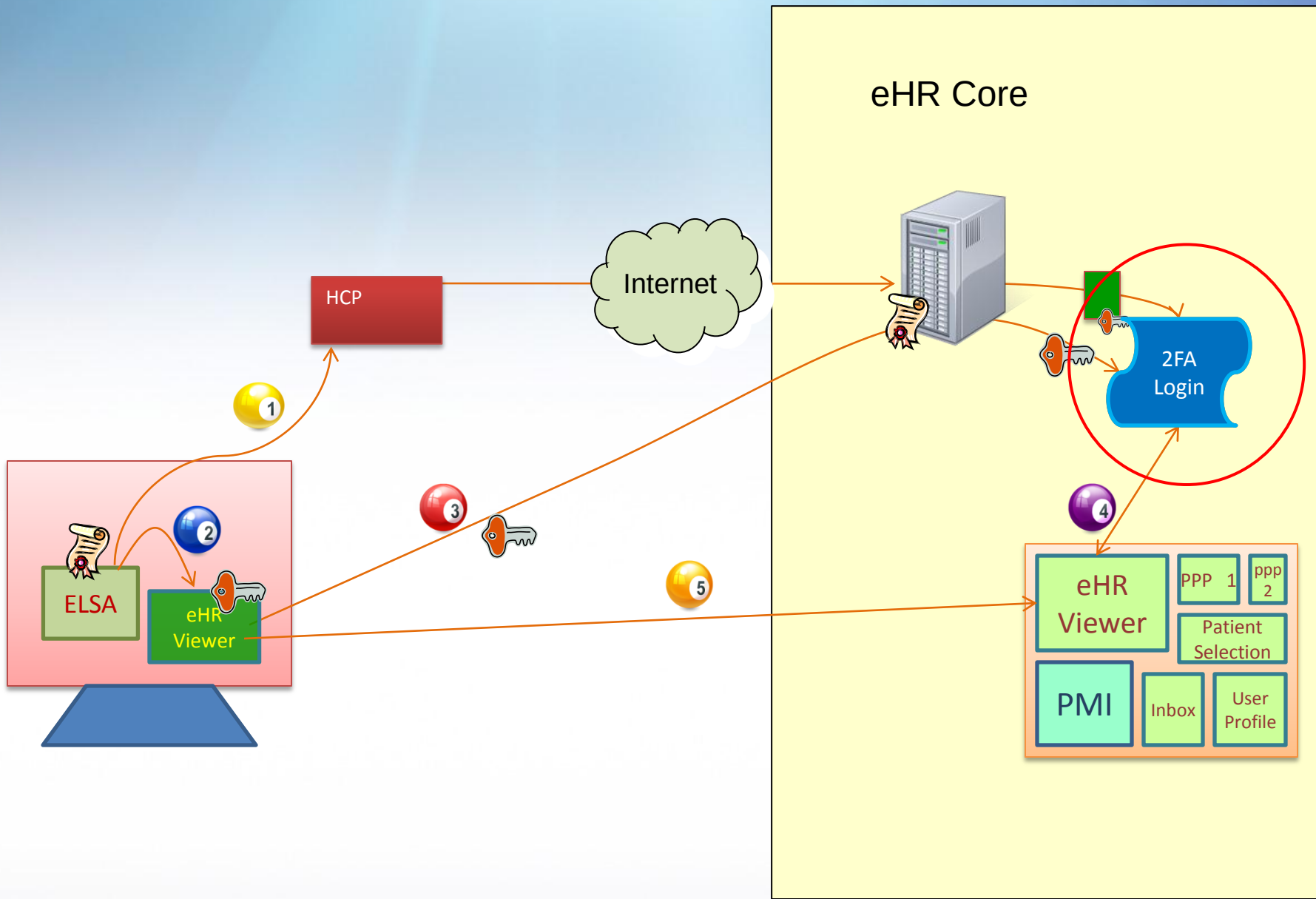
Mode A: Connect to eHR Core via EMR



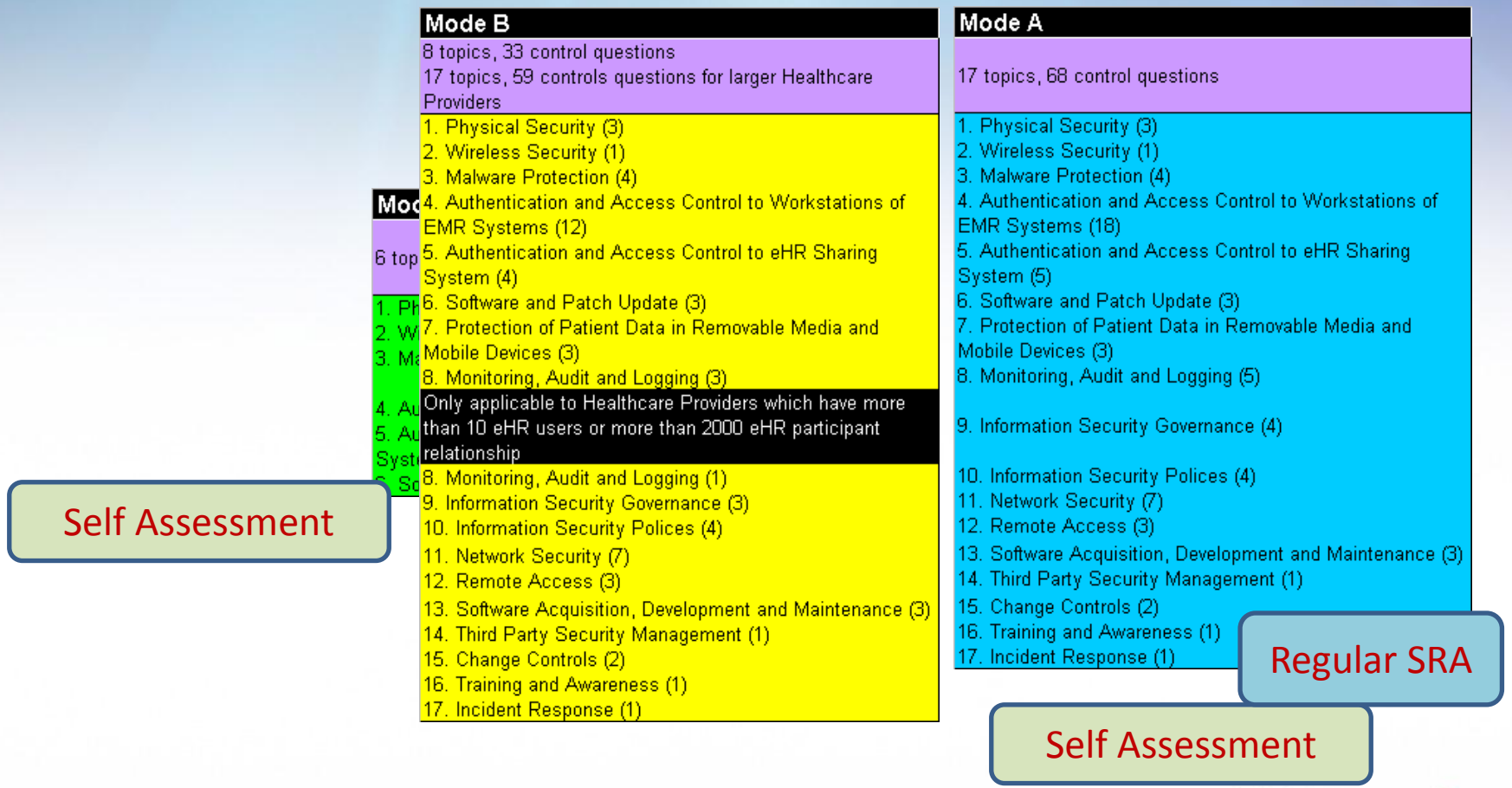
Mode B: Connect to eHR Core via EMR



Mode C : Workstation Based Connection



Security Assessment Requirement for Different Connection Modes



Technical Preparation

- Security Assessment
  - Self assessment checklist on security
  - Mode A requires Security Risk Assessment on systems with direct connection to eHRSS
- Connectivity
  - Network infrastructure requirements depend on Connection Mode(s) elected by HCP
  - EMR System enhancement to integrate with eHRSS
  - Integration test and registration with eHRSS

Patient’s consent to HCP :

Relationship Based Access

Patient Consent

- Govern which HCP can view patient's eHR / upload patient data to eHR
- Use eHRSS <Build Relationship> function to record patient's consent to HCP
- Means of consent
  - HK SmartID Card
  - Written form
  - One-time password

- Technical Preparation
  - Install SmartID Card Reader
  - PMI related enhancements

User Access Control :

Role Based Access Control

Role-based Access Control

- Only authorised users can access eHR under ‘patient-under-care’ & ‘need-to-know’ principles
- A user can access a patient’s record only if :
  - The user can be individually identified & authenticated
  - The user is accessing eHRSS through ‘connection’ of the HCP which his /her account belongs to
  - The patient has a current and valid relationship with the HCP
- Role based access
  - Functions / Data accessible by user depend on the role assigned to the user by HCP
  - Only registered Healthcare professionals (with registration *with Boards & Councils*) can view clinical data
  - Healthcare administrative/ancillary staff has administrative function access only

Related Preparation

- Identify which healthcare staff can access eHR
- Determine what role(s) to be assigned to the staff
- Collect personal data and agreements from staff to create eHR user accounts in eHRSS
  - HKIDs & Names
  - B&C Registration numbers for healthcare professionals requiring access to patient's clinical data
- Create staff accounts in eHR Sharing System
  - Via online <User Account Management> function, or
  - Via batch data interface
  - Assign security token if required
- Ongoing maintenance, e.g. termination of service

Technical Preparation

- For Connection Modes A & B:
  - Enhance local EMR systems to store eHRUIDs generated by eHRSS for use in system interfaces
- If user accounts are to be set up / maintain via batch interface :
  - Develop batch interface program
  - Integration test with eHRSS
  - System handling of eHRUIDs returned by eHRSS
  - Exception handling and on-going maintenance

DATA INTERFACE

Sharing Data to eHR

- HCPs to provide readily sharable electronic data within scope to eHR under patient's consent
- eHR data standard
  - Importance of accurate patient registration (PMI) data
  - Multi standards compliance level for sharable data
    - Level 1 : free-text / PDF document
    - Level 2 : structured data with local value
    - Level 3 : structured data with standard value
  - Computer generated data only (including PDF), no scanning of manual records

Phased Approach

eHR Section	Level 1	Level 2	Level 3
eHR Participant			
Encounter			
Referral			
Clinical note / summary			
Adverse reaction / allergy			
Clinical alert			
Problem			
Procedure			
Birth record			
Assessment / physical exam			
Social history			
Past medical history			
Family history			
Drug – prescription record			
Drug – dispensary record			
Immunization			
Clinical request			
Diagnostic test result – Laboratory			
Diagnostic test result – Radiology			
Diagnostic test result – Other investigation			
Care & treatment plan			

Key : Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5

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Phase 1 eHR

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Technical Preparation

- Data Upload to eHRSS
  - Determine data domain to be shared & compliance level for each domain
  - If code mapping is used, establish sustainable mechanism (people, system, workflow) to maintain the mapping
  - Determine the interface mechanism:
    - Online message or batch interface
    - Interface Frequency
    - Communication channel and Network set up
  - Develop interface programs and test with eHRSS
  - Register domain & compliance level with eHRSS
  - Mechanism and workflow for on-going exception handling and reconciliation

Technical Preparation

- Data Download from eHRSS
  - PMI and Allergy data only
  - Via Batch interface or online web services, interface channel
- PMI data download
  - Need to ensure accurate identification of individual patient
  - Interface with eHRSS to communicate PMI data (HKID, name ...)
  - Enhance EMR system to store eHR no. for communication and data interfaces with eHRSS
  - Enhance EMR system to store relationship, including date, information to ensure correct data upload
  - Establish processes (system and manual) for exception handling
- Allergy data download
  - Enhance EMR system to interface with eHRSS
  - Enhance EMR system to facilitate integration of downloaded allergy data with local EMR data

Summary

- Connection Modes
  - Determine type of connection modes
  - Complete Security assessment checklist
  - Complete SRA if applicable
  - Develop EMR system integration for modes A & B
- User Account Management
  - Collect users data and determine related roles
  - Develop batch interface for user accounts if necessary
  - System enhancement to store & use eHRUID

Summary

- Data Interfaces
  - Determine domain, compliance level & interface method
  - Develop interface programs
  - Establish network infrastructure for data interface
- PMI data
  - Determine interface method
  - Enhance system to process / submit PMI data downloaded from eHRSS
  - Enhance system to store eHR no. & relationship information

Thank You