

Dynamic Provisioning for Mobility: Mobile and Directory (MaD) Challenge

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Agenda

- Introduction: The MaD Challenge Effort (CA)
- Dynamic Provisioning Scenarios (CA)
- Challenge Scenario: Airport/Airplane (CA)
- Project Status (CA)
- MaD Information Model (InfoMod) (AW)
- MaD InfoMod Validation (CA)
- Call for Participation (CA)

The MaD Challenge Effort

- Concept:
 - Directory-enabled roaming for end-users across IP-based data networks.
- Purpose:
 - Demonstrate through scenarios and a framework the use of directory services to support roaming in a IP-based mobile environment.
- Goals & Objectives
 - Define:
 - a provisioning information model for mobility management
 - operational models for storage and retrieval of dynamic provisioning information
 - contextual usage models for directory services
 - Understand end-user requirements
 - Evangelize a standards-based architectural vision
 - Demonstrate the concept using standards-based technology
 - Build a demo system using technologies commercially available now or near-term



The MaD Challenge Effort (cont.)

- Challenge Partners:



- Challenge Audience:

- Enterprises/IT Customers
- Wireless Internet Service Providers (WISPs)
- Directory vendors
- Management infrastructure tool vendors
- Consulting firms



The MaD Challenge Effort (cont.)

- Challenge Team:

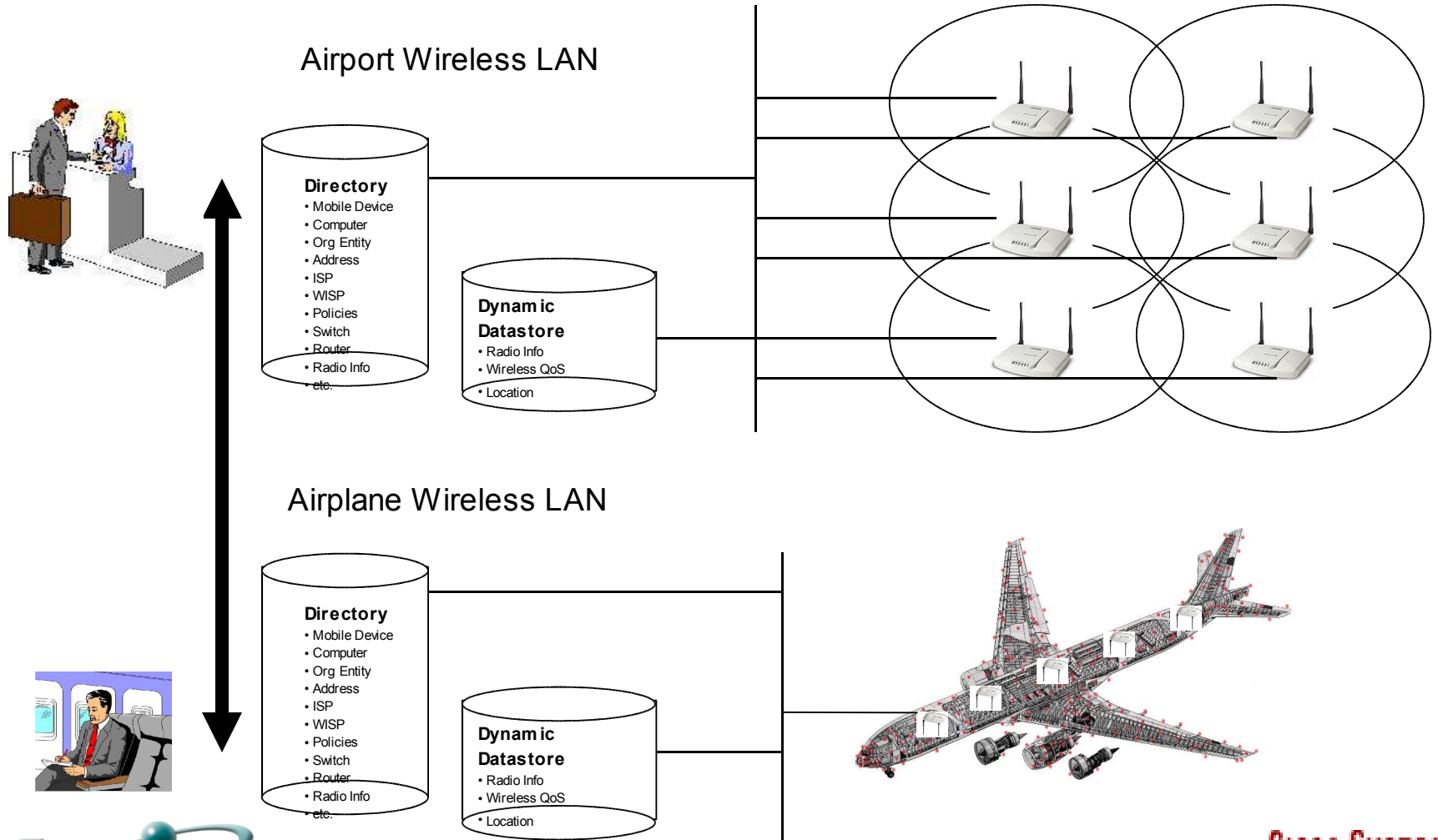
- Chris Apple DSI Consulting/The Open Group
- Winston Bumpus Novell/DMTF/The Open Group
- Felix Gaehtgens Symlabs/The Open Group
- Chris Harding The Open Group
- Ed Harrington EPH Associates/The Open Group
- Jim Keeler Wayport
- Martin Kirk Pegasus/The Open Group
- Roger Mizumori Waterforest Consulting/The Open Group
- Mez Morrell Nexor/The Open Group
- Doug Obeid NAC
- Pat O’Kane ePresence/NAC
- Steve Omrani IBM/The Open Group
- Richard Paine Boeing/NAC/The Open Group
- Karl Schopmeyer Pegasus/The Open Group
- Skip Slone Lockheed Martin/The Open Group
- Gavenraj Sodhi Business Layers/The Open Group
- Andrea Westerinen Cisco/DMTF
- Fred Wettling Bechtel/NAC



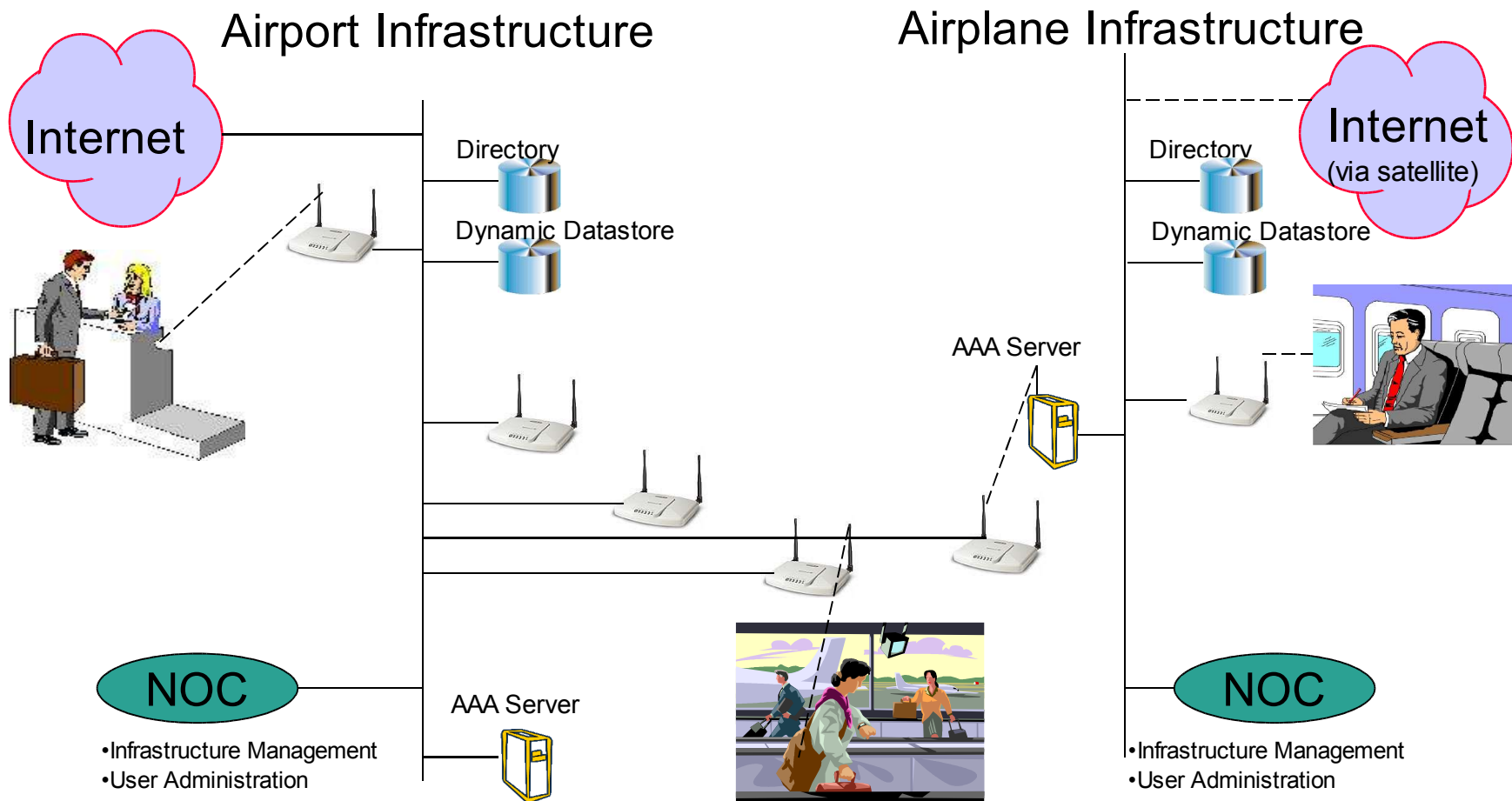
Dynamic Provisioning Scenarios

- Customer Relationship Management (CRM):
 - Sales Force Automation (SFA):
 - Consumer Packaged Goods Field Sales
 - Real Estate Agents
 - Field Service Automation (FSA):
 - Insurance Claim Adjustment
 - In-Home Appliance Repair
- Travel-Related Services:
 - IP-based Application Session Roaming
 - Traveling Sales Executive:
 - Office-to-Airport
 - Airport-to-Airplane
 - Airplane-to-Airport

MaD Challenge Scenario



MaD Challenge Architecture

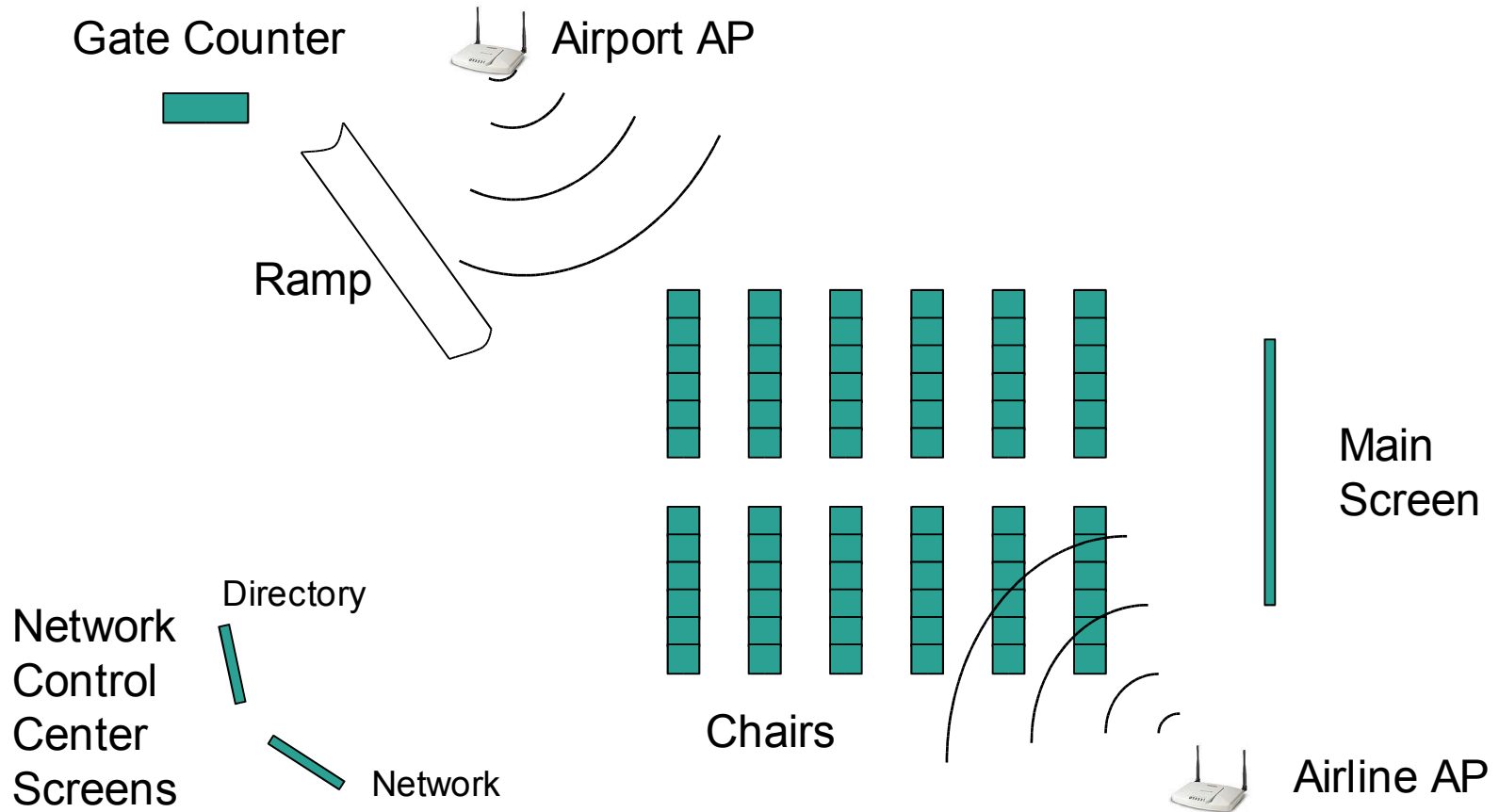


MaD Design Toolkit

- Defining the interfaces and shared data using standards
 - Address hardware, security, and registration assumptions
- Mediation layer
 - Common Information Model (CIM)
 - Pegasus (XML CIM)
 - Open Group and Open Source
- Use cases, application and information flow analysis
- Databases
- Directories, Virtual Directories, Meta Directories
- Managed WiFi LAN Equipment



MaD Challenge Demo



MaD Challenge Project Status

- Concept, Purpose, Goals, & Objectives Defined
- High-Level Architecture Completed
- Preliminary Demo Planning Completed
- Information Model (InfoMod) Drafted
- InfoMod Validation Testing In-Progress
- Detailed Architecture/Design Commencing



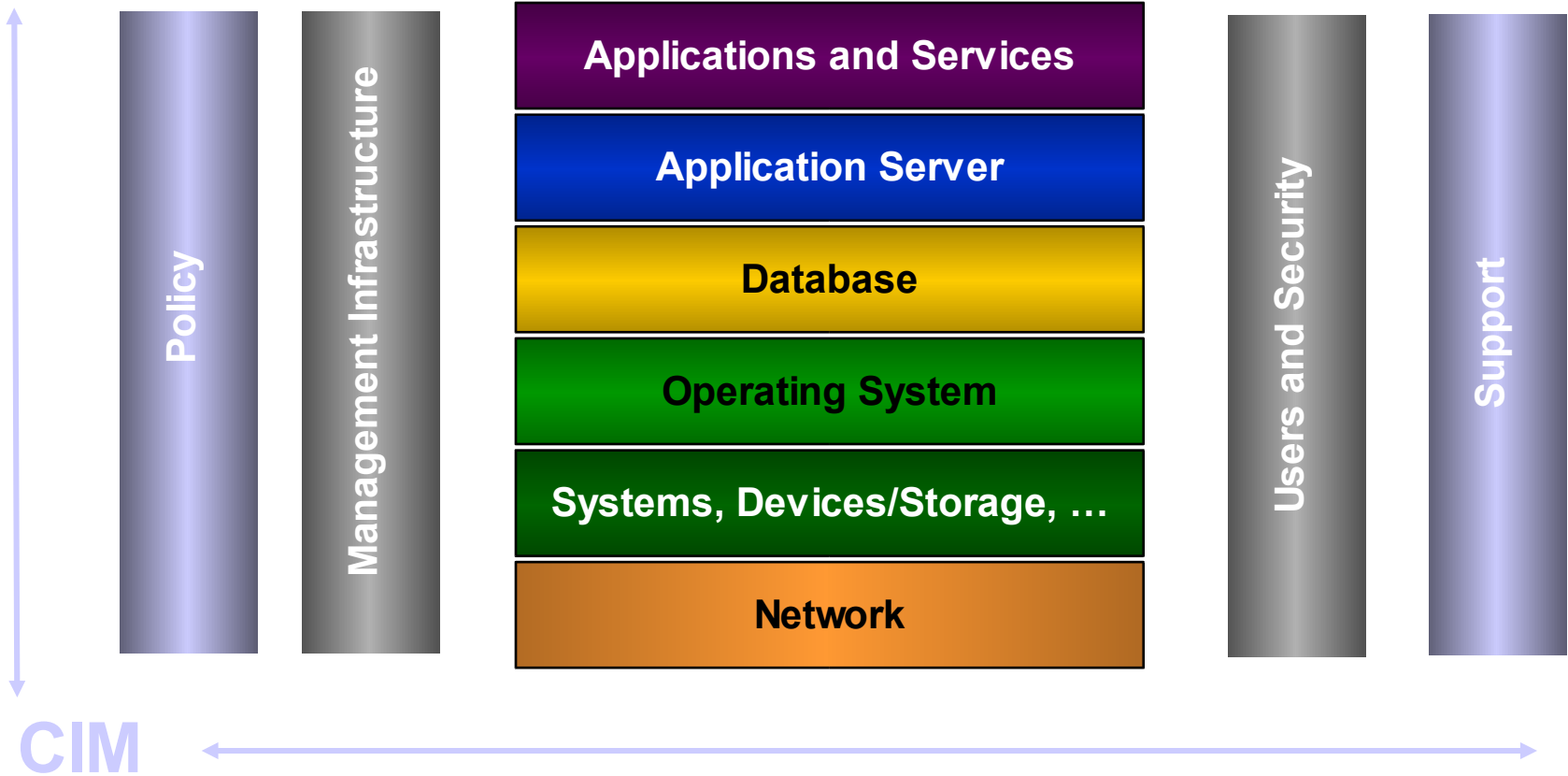
MaD Information Model Overview



Why CIM?

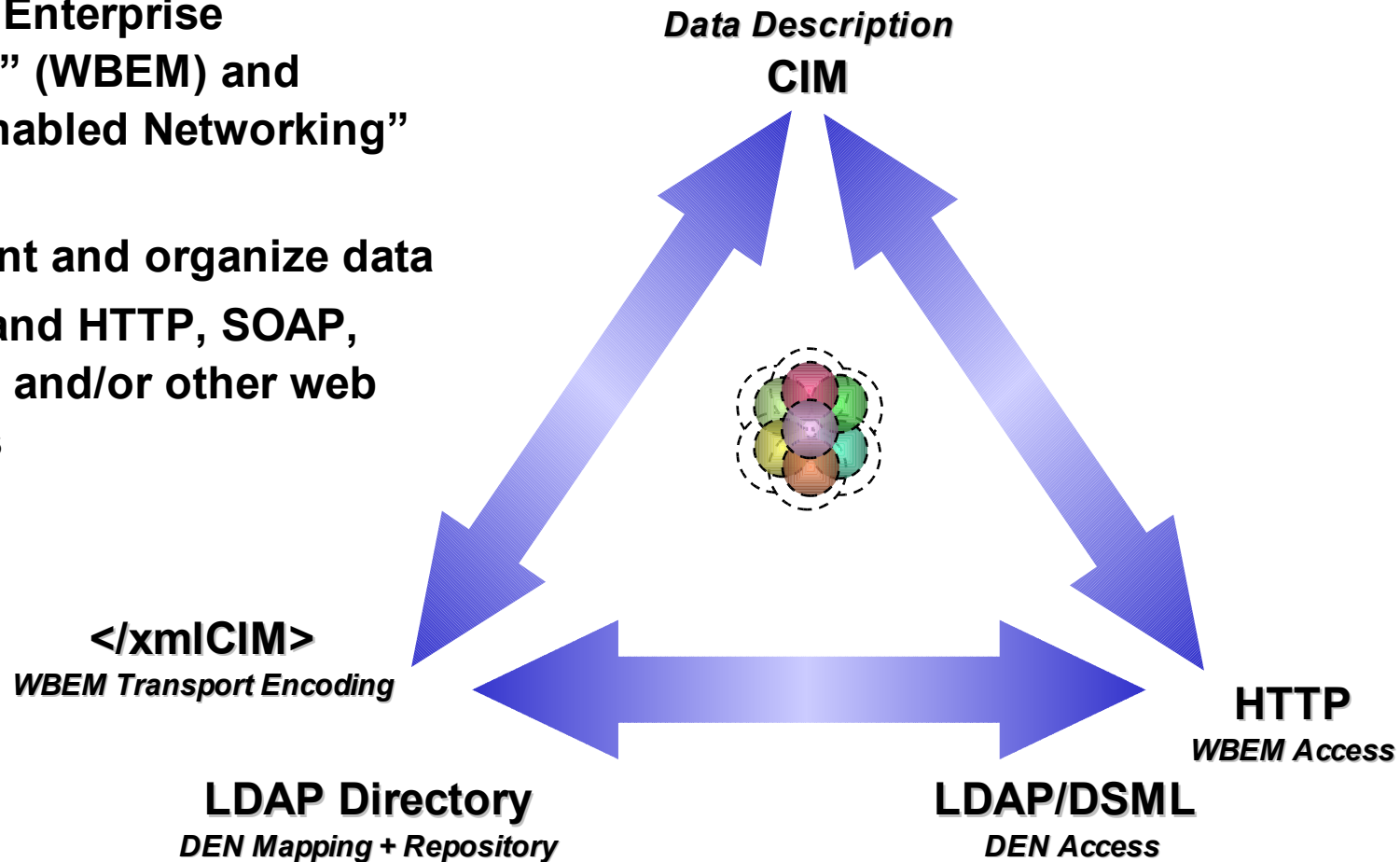
- Internet- and enterprise-wide management
 - Wide breadth of objects + repository independent
 - Unifies and extends existing standards (MIBs, X.500, M.3100, ...)
- OO design
 - Abstraction, inheritance, ability to “classify”, extensibility via subclassing
 - Well-defined “locations” and usage semantics for classes and associations
- Associations depict relationships
 - Dependencies, topologies, aggregations, scoping, ...
- “Standard”, inheritable methods

CIM Schema Coverage



CIM on the Wire and in the Directory

- “Web-Based Enterprise Management” (WBEM) and “Directory Enabled Networking” (DEN)
- CIM to present and organize data
- Use of XML and HTTP, SOAP, LDAP, DSML and/or other web technologies



How Is CIM Defined?

- MOF - Managed Object Format (ASCII or Unicode)
 - Human and machine readable definition of the classes
 - Format: Class “qualifiers” (meta-data), name and superclass / Property “qualifiers”, datatype and name / Method name, return code, “qualifiers” and parameters
 - http://www.dmtf.org/standards/cim_schema_v27.php
- UML - Unified Modeling Language diagrams
 - Rendered using VISIO and also translated into PDF
- Whitepapers
 - http://www.dmtf.org/standards/published_documents.php

MaD InfoMod: DMTF CIM Profile

```
// Qualifiers to define class, property and method "meta-data"  
#pragma include ("Core27_Qualifiers.mof")
```

```
// Core classes as the "top of the tree" – Most are abstract  
// ManagedElement, Dependency/ConcreteDependency,  
// Component/ConcreteComponent, ManagedSystemElement,  
// LogicalElement, EnabledLogicalElement, System, AdminDomain,  
// SystemComponent, Service, HostedService, ServiceComponent,  
// ServiceServiceDependency, ServiceAvailableToElement,  
// ServiceAccessPoint, RemoteServiceAccessPoint, RemotePort,  
// HostedAccessPoint, ServiceAccessBySAP, SAPSAPDependency,  
// ActiveConnection, ProtocolEndpoint, BindsTo,  
// SettingData, Profile, ElementSettingData and ElementProfile  
// (from Core27_CoreElements.mof)  
#pragma include ("MaD_Core.mof")
```



MaD InfoMod: DMTF CIM Profile

```
// PhysicalElement, Location, ElementLocation, ContainedLocation,  
//   and SystemPackaging (from Core27_Physical.mof)  
// PhysicalPackage, Container, PhysicalFrame, Rack, Chassis  
//   (from Physical27_Package.mof)  
// Card (Physical27_Card.mof)  
#pragma include ("MaD_Physical.mof")
```

Describes physical location, locations within “larger” perspectives (ContainedLocation), packaging (instantiate Card and Chassis) and the containment of cards in a chassis (via the Container association). To tie the physical packaging to a system, use the SystemPackaging association.

MaD InfoMod: DMTF CIM Profile

```
// Miscellaneous - Logical information:  
//   SoftwareIdentity (from Core27_Software.mof),  
//   ComputerSystem (from System27_SystemElements.mof), and  
//   LANEndpoint and IPProtocolEndpoint (from  
//   Network27_ProtocolEndpoints.mof)  
// New subclass of SettingData - ChallengeUserPreferences  
#pragma include ("MaD_Logical.mof")
```

Describes basic software assets/inventory, general ComputerSystems (tied to a location using the ElementLocation association in the Physical MOF), and the Ethernet LAN and IP Endpoints in use

Also, the challenge-specific setting, DHCP and wireless classes will be included in this MOF



MaD InfoMod: DMTF CIM Profile

```
// WBEMService, ObjectManager,  
//   ObjectManagerCommunicationMechanism,  
//   CIMXMLCommunicationMechanism,  
//   CommMechanismForManager,  
//   Namespace, SystemIdentification, NamespaceInManager, and  
//   SystemInNamespace (from CIM_Interop27.mof)  
// New classes – DirectoryService and  
//   DirectoryCommunicationMechanism (LDAP, DSML or both)  
#pragma include ("MaD_Interop.mof")
```

Data provided by Pegasus and minimal information about the directories in the challenge



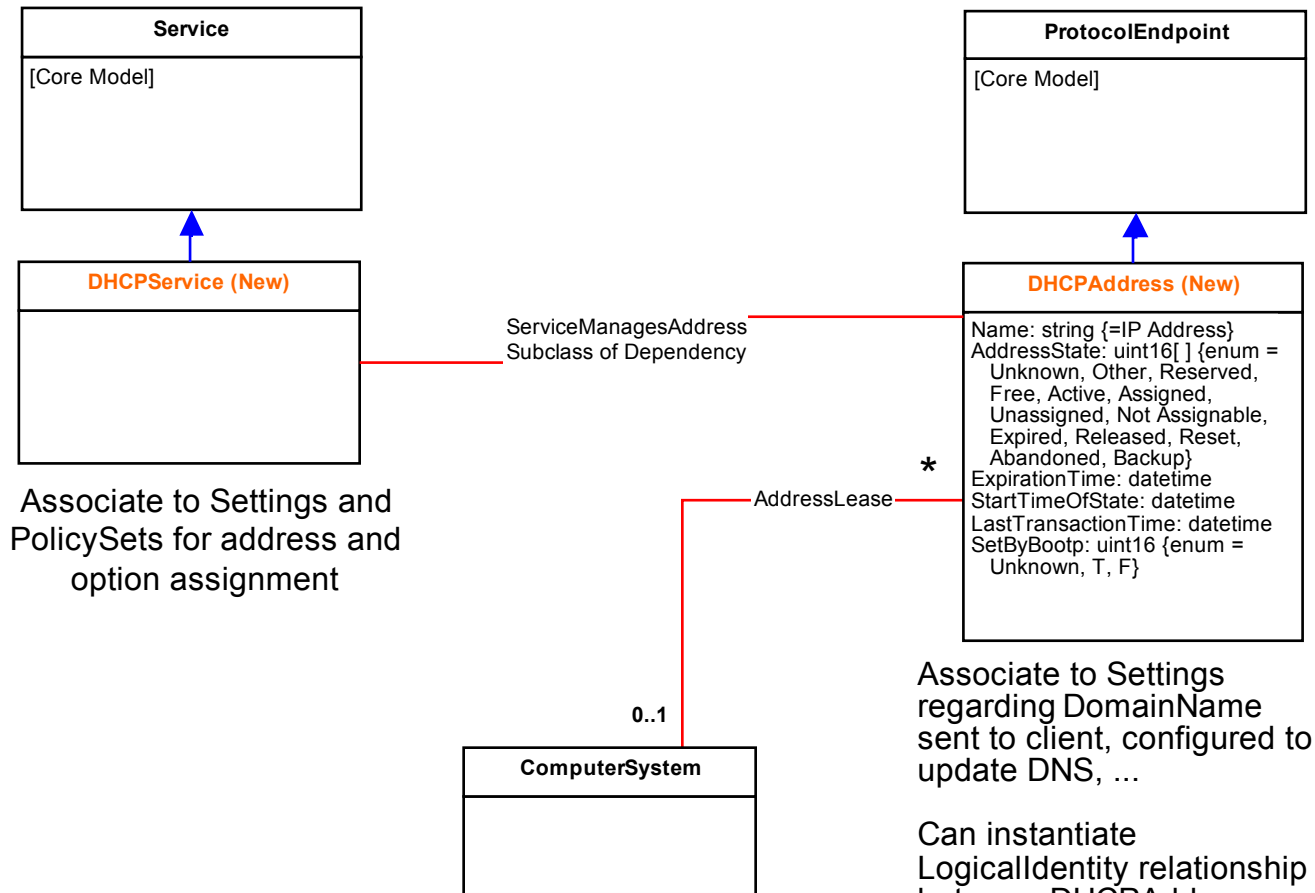
MaD InfoMod: DMTF CIM Profile

```
// OrganizationalEntity, Organization, OrgStructure, and  
//   Person (subset of properties) (from User27_Org.mof)  
// New classes - CredentialData, Identity, AssignedIdentity, and  
//   CredentialForIdentity  
// #pragma include ("MaD_User.mof")
```

Identities are instantiated based on some or no credentials. If we want to use credentials (such as a boarding pass), reviewing these and entering OK in an application could cause the Identity's TrustEstablished boolean to be True. Use the AssignedIdentity association to tie the Identity to real Person.

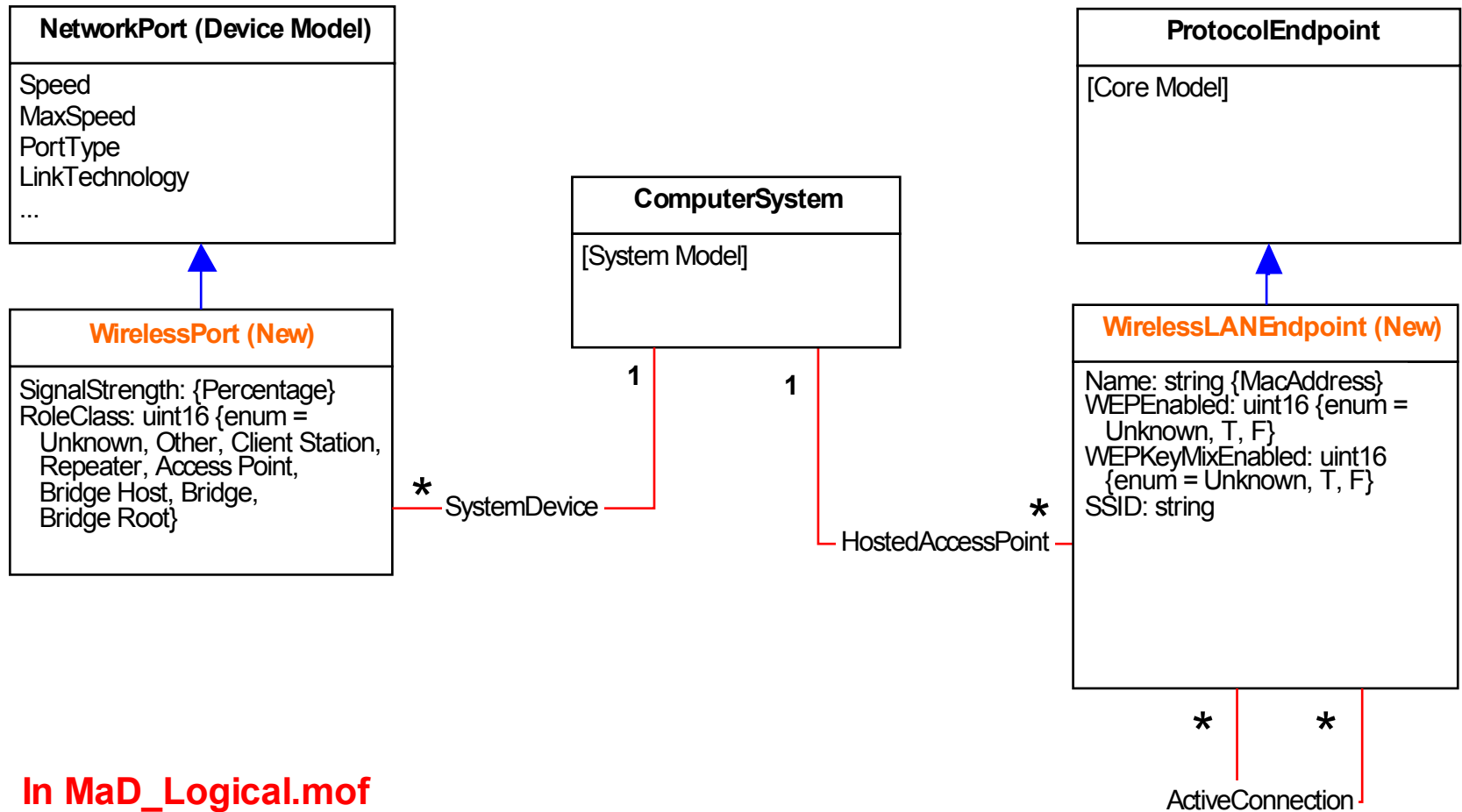


MaD InfoMod: DHCP Schema



In MaD_Logical.mof

MaD InfoMod: Wireless Schema



In MaD_Logical.mof

MaD InfoMod Validation



MaD InfoMod Testing

Early Stage Testing:

- Baseline LDAP Data Interchange Format (LDIF) file with LDAPv3-compliant schema elements
- Tweak LDIF files as needed for various LDAPv3 server implementations
- Target directory platforms for loading schema:
 - IBM Directory Server 5.1
 - iPlanet Directory Server 5.1 SP2
 - Microsoft Active Directory (W2K Server, Windows Server 2003, ADAM Beta)
 - Novell eDirectory 8.7
 - OpenLDAP 2.1.21
 - OctetString Directory Server Express 2.0.1

MaD InfoMod Testing (Cont.)

Next Steps:

- Develop LDIF files with entries compliant with the MaD Schema
- Load entries into various LDAPv3 directory servers
- Test search/retrieval capabilities
- Set up managed WiFi LAN equipment
- Use virtual directory, meta directory, and/or directory server replication technologies to automate dynamic provisioning of directory information
 - from WiFi equipment through management interfaces
 - associated with:
 - identity and identity assertions
 - hand-offs of authentication credentials and authorization assertions



Call for MaD Participation

- **Near-Term Activities:**
 - MaD InfoMod validation testing
 - Detailed architecture/design
 - Demo system development, integration, and testing
- **MaD Project Team Needs:**
 - END USER REPRESENTATION
 - Wireless Roaming Business Model Input
 - Wireless Roaming Billing, Accounting, and Settlement Input
 - Additional Wireless Communications Equipment Vendor Participation



Questions?

- Contact information after the session:

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