



Extending Enterprise Architecture Modeling Languages: Application to Telecommunications

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Agenda

- **How and why introduce domain specificity in Enterprise Architecture?**
- **Through Enterprise Architecture Modeling Language (EAML) extension**
- **Instanciating to Telecommunications**
- **Applying the extended EAML to a case study**
- **Conclusion and Perspectives**



Context: Why introduce domain specificity in Enterprise Architecture?

- **Enterprise = complex adaptive system.**



- **Enterprise Architecture (EA) = a way to document, understand and master this complexity.**
 - EA Framework = describe a wide range of domains;
 - Integrated models of the enterprise:
 - Business and Application layer - OK;
 - Technical layer – **more details are needed to describe a system.**
 - EA Modeling Language (ML) = a language for visualizing, specifying, constructing and documenting the artifacts of a software-intensive enterprise.



Problem : How to introduce domain specificity in Enterprise Architecture?

- **Use EA framework and ML at Business and Application layer**
- **AND** Introduce more domain specificity at Technical layer

- **HOW?**



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Solution/Contribution: Through EAML extension

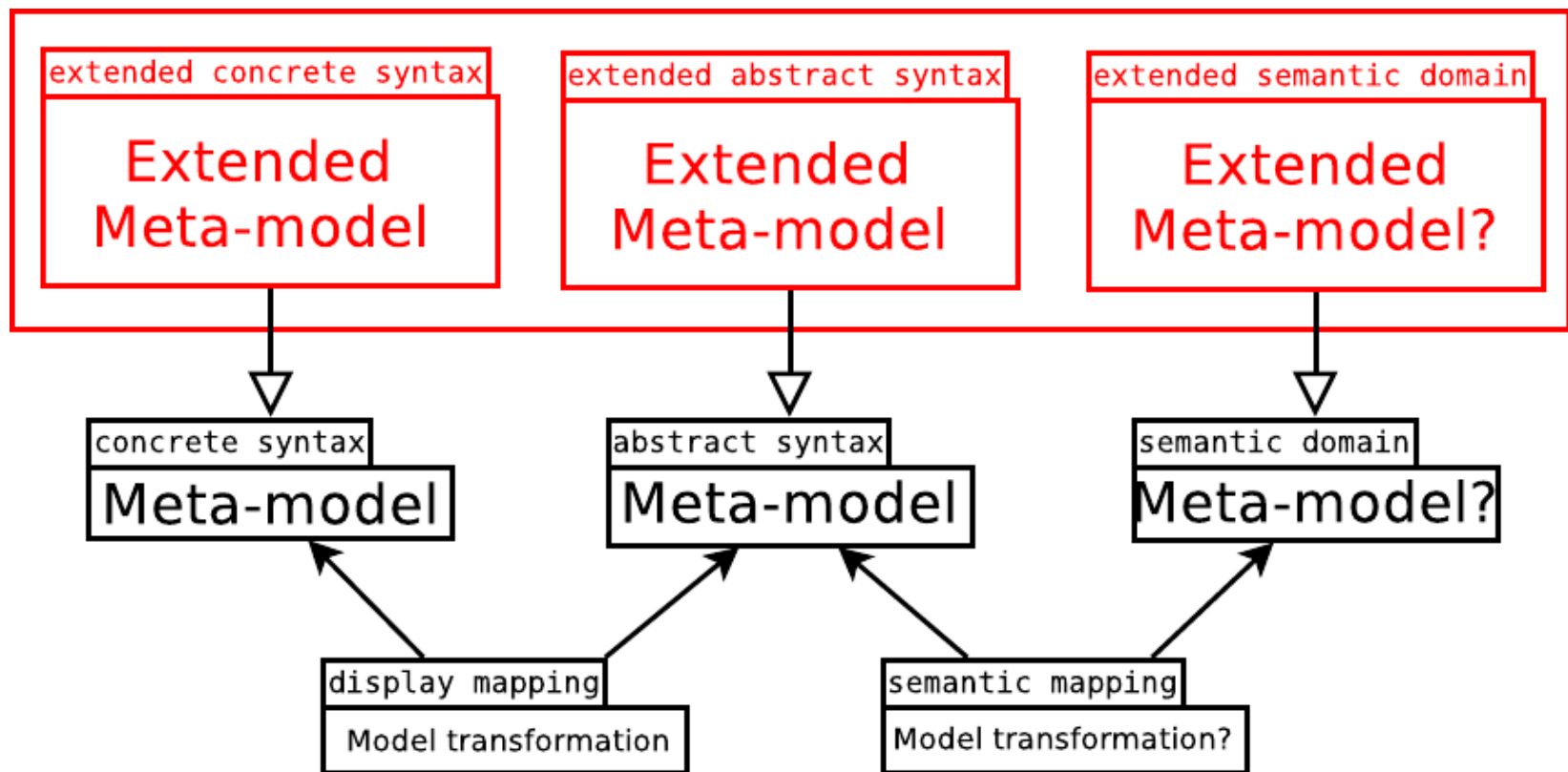
- **Profile = generic extension mechanism for customizing reference languages with constructs that are specific to particular domains, platforms.**

- **Advantages:**
 - Reuse of reference language and tools;
 - Strictly additive extension => profile tools have to process only additions ;
 - Reference language – facilitates interoperability between all its profiles.



Solution/Contribution: Through EAML extension

- **Language extension with the Meta-modeling approach**





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Solution/Contribution: Instanciating to Telecommunications

- **Service creation = complex activity because of:**
 - difficult technical issues, but also
 - big number of actors,
 - difference in each actor's perspective and objectives.
- **One actor: Service Provider = organization that creates value-added services.**
- **Service Provider requirements:**
 - Req 1: An overall model;
 - Req 2: Domain specificity;
 - Req 3: Rapid prototyping;
 - ...



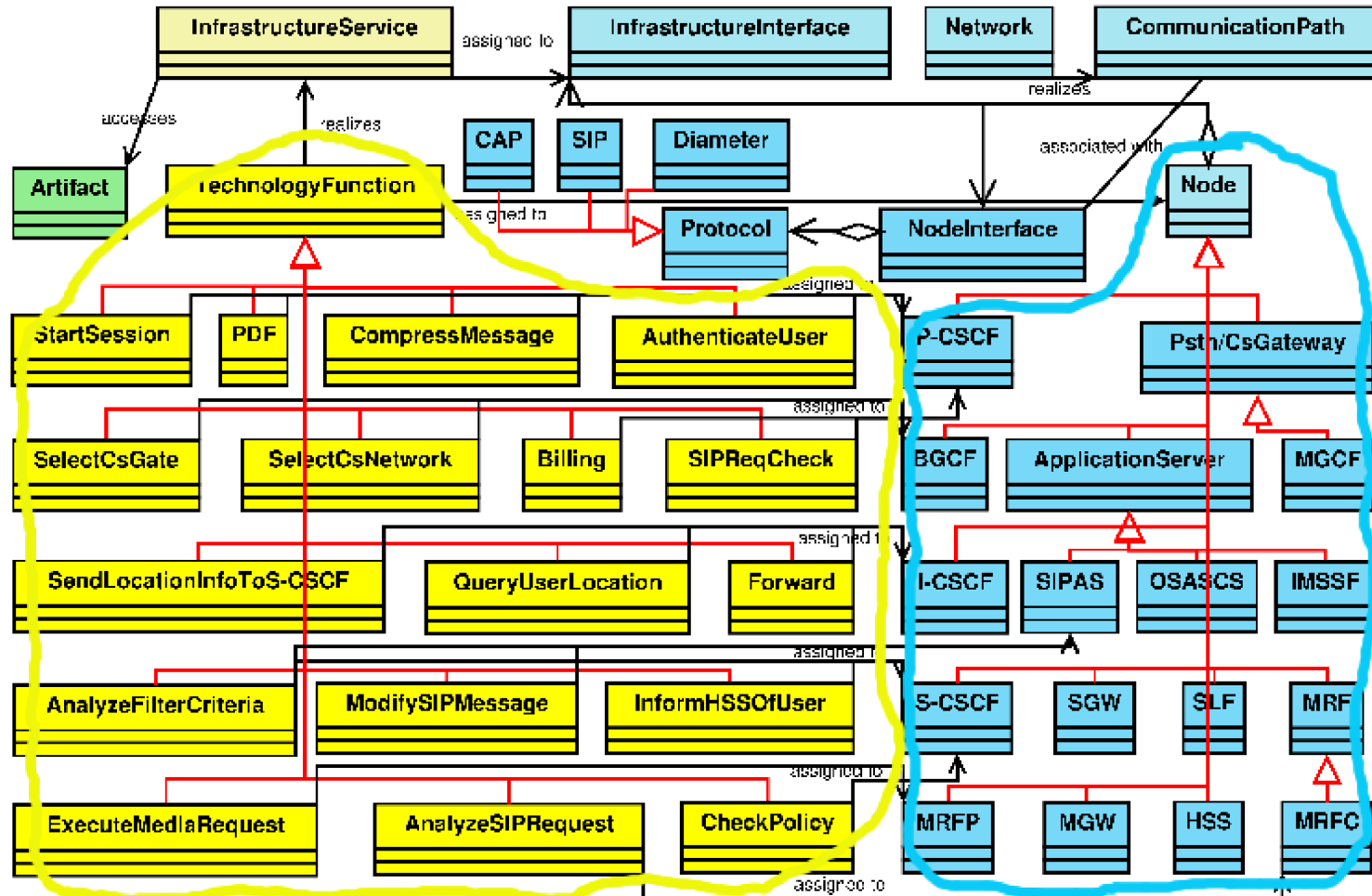
Solution/Contribution: Instanciating to Telecommunications

How EAMLs answer Service Provider's requirements:

- Req 1: An overall model → • EA frameworks and MLs ;
- Req 2: Domain specificity → • Introduce telecommunications specificity as profiles of EAMLs ;
- Req 3: Rapid prototyping → • Meta-modeling approach, through code generation and easy integration with tools for reference language.

Solution/Contribution: Extending ArchiMate EAML for Telecommunications

- Extending the Abstract Syntax**





Solution/Contribution: Extending ArchiMate EAML for Telecommunications

- **Extending the Concrete Syntax**





Solution/Contribution: Extending ArchiMate EAML for Telecommunications

- **Operational semantics: excerpt of generated Java code**

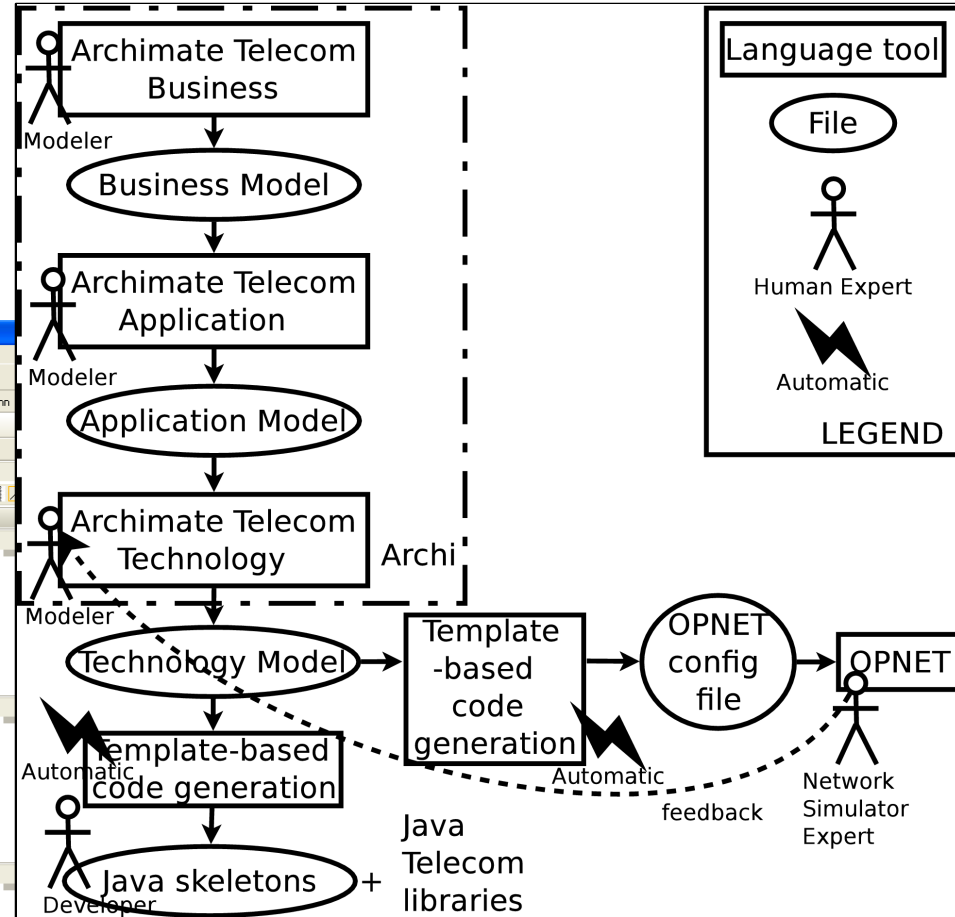
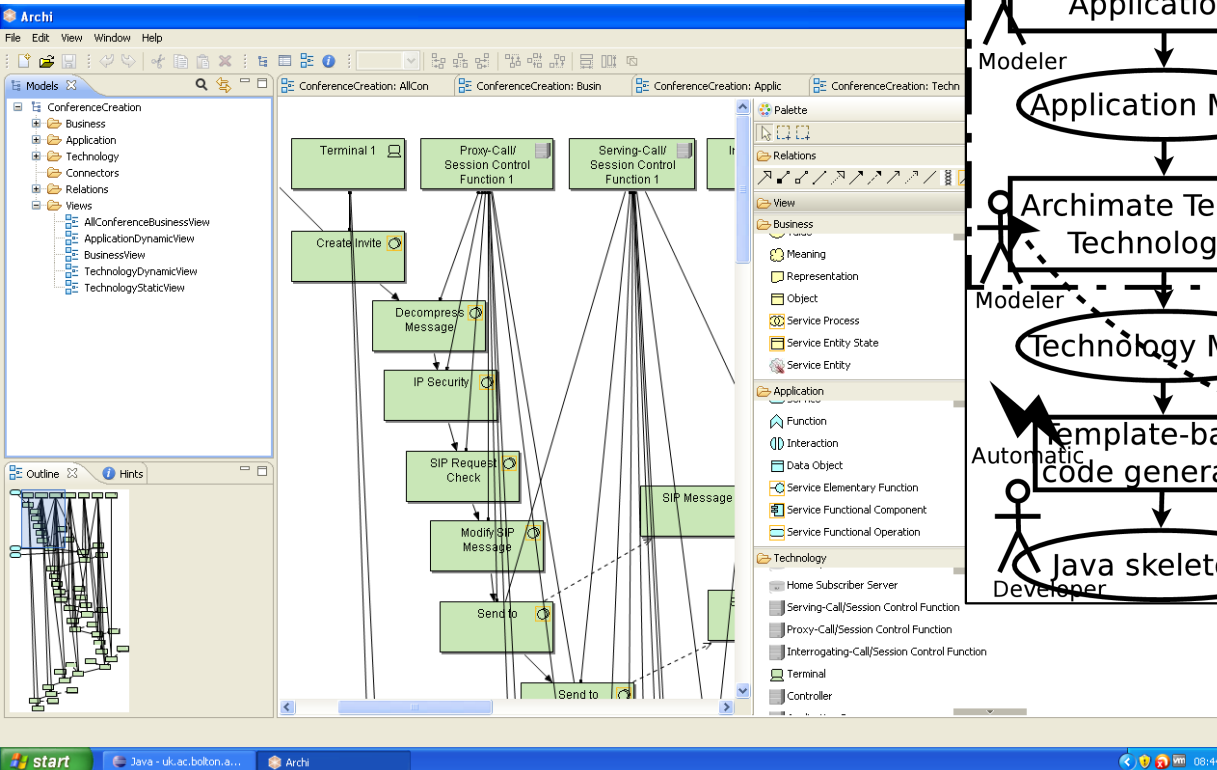
```
1 public class Clientpart1ofconferencingsystem {
    private String name = "
        Clientpart1ofconferencingsystem";
3 private String id = "78d717c8";
    public Clientpart1ofconferencingsystem () {}
5 public void setName(String newName) {
    this.name = newName;}
7 public String getName() {
    return name;}
9 public void setId(String newId){
    this.id = newId;}
11 public String getId() {
    return id;}
13 public void joinconference () {}
    public void launchconferenceconsole () {
15     this.joinconferencebysendingInvite ();}
    public void joinconferencebysendingInvite () {
17     Conferencingsystem conferencingsystem = new
        Conferencingsystem ();
        conferencingsystem .checkresponse ();}
19 public void displayerror () {}
    public void subscribetconference () {
21     this.joinconference ();} }
```



Solution/Contribution: Extending ArchiMate EAML Tools for Telecommunications

Overview of language tools

Extended Archi





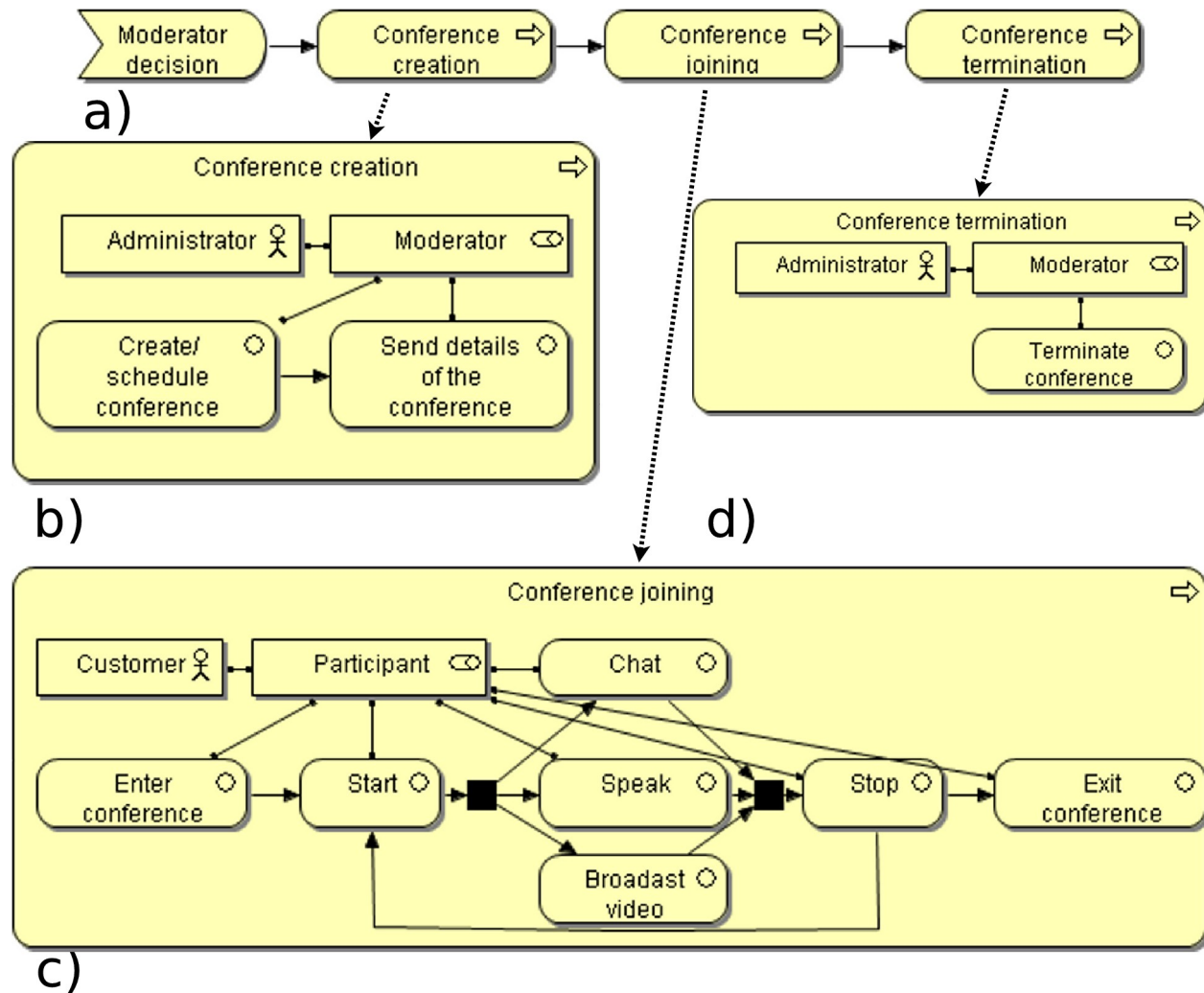
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Applying the Extended EAML to modeling a telecommunications conferencing service

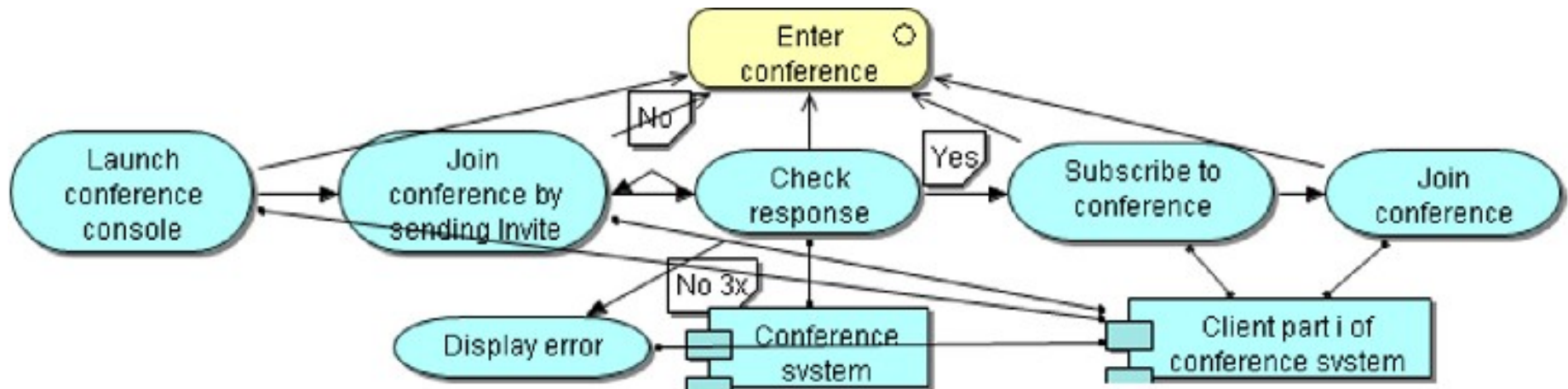
The model of a conferencing service at the ArchiMate Business layer





Applying the Extended EAML to modeling a telecommunications conferencing service

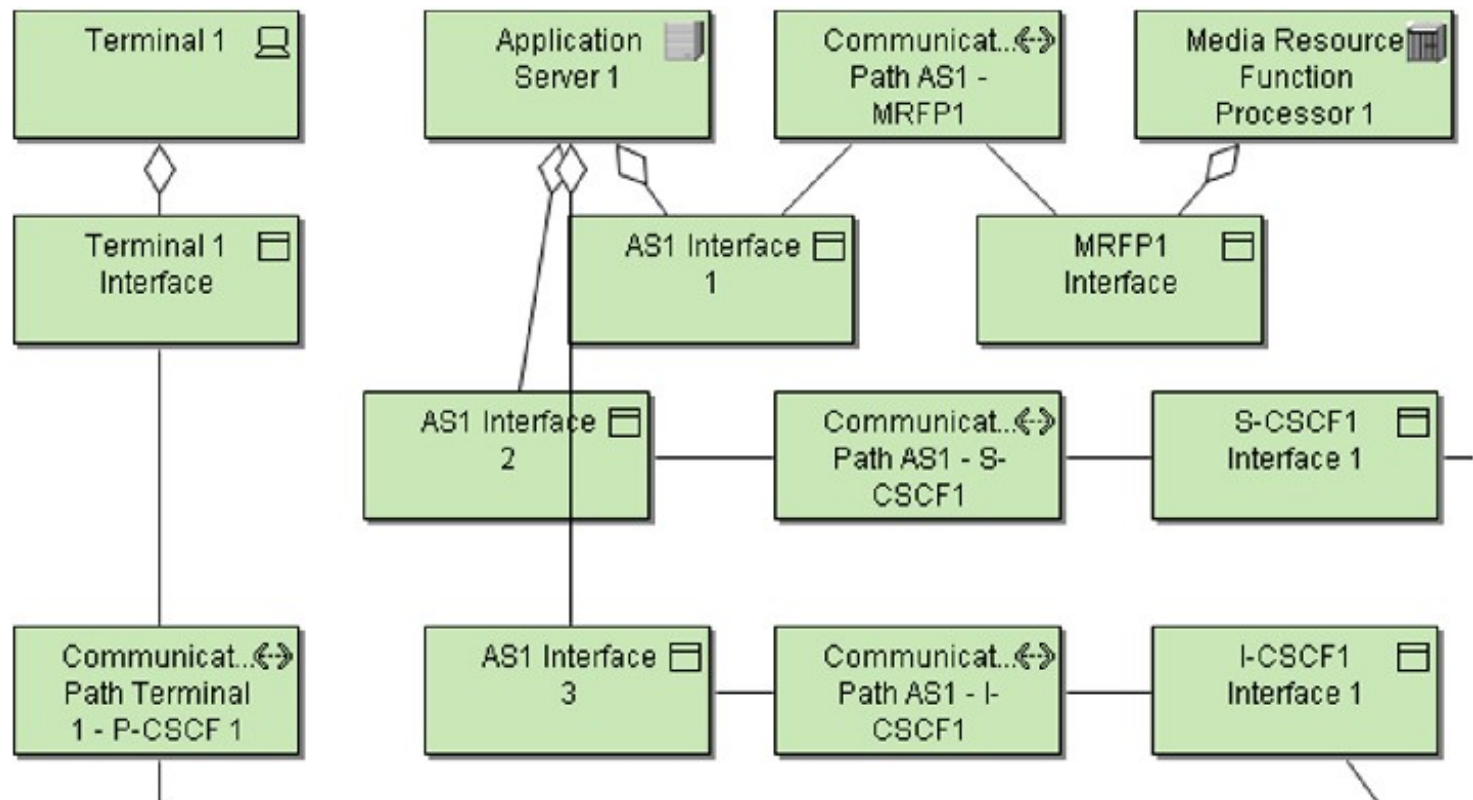
- **Excerpt from the model of a conferencing service at the ArchiMate Application layer**





Applying the Extended EAML to modeling a telecommunications conferencing service

- Excerpt from the model of a conferencing service at the **Telecom ArchiMate Technology layer**





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Conclusion and Perspectives

- Identified a real need for extending EAMLs with domain specificity.
- Proposed as solution the extension of EAMLs as profiles, with the Meta-modeling approach.

- Future (already done): Integrated a transversal ML for capturing Decision Rationale, thus enhancing collaboration.

