Policy-Based Service Management

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Performance from Experience

An SAIC Company

Fuchun Joseph Lin (Joe)
Chief Scientist

Telcordia Technologies, Inc.
445 South Street 1A-240R
Morristown, NJ 07960-6438
Voice: +1-973-829-4351
Fax: +1-973-829-5889
E-mail:
fjlin@research.telcordia.com

Outline

- From Policy-Based Network Management to Policy-Based Service Management
- Creating New Services via Bundling and Aggregation
- Desired Bundled Service Behavior as Policy
- Enforcement of a Chosen Service Policy by FIM Rule

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From Policy-Based Network Management to Policy-Based Service Management (1)

- Policy-Based Network Management
  - An emerging trend to better manage IP networks
  - 45% of network operations cost of IP networks is due to the cost of configuring the networks
  - This is an overly complex, manually intensive, and constantly changing task
  - Current commercial systems only allow limited QoS and access control polices to be specified by users
  - Scalability is still a problems when dealing with large scale networks
  - Policy language (or rules) is the centerpiece of any policy-based management system but is still at its infancy (1st order predicate logic, temporal logic, decidability etc?)
  - Other research issues include run-time conflict resolution, hierarchical or flat rule structure etc.

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From Policy-Based Network Management to Policy-Based Service Management (2)

- Policy-Based Service Management
  - Move up one layer higher
  - To better manage and leverage multitude of services enabled by PSTN, mobile, and IP networks
  - There exists no methodology to do this in order to quickly offer new services to end customers
    - But industry is doing it – e.g. bundling of T-Mobile SMS and AOL IM and bundling of NTT DoCoMo 2G and contents (i-mode)
    - However largely ad hoc and non reusable
  - The issue is how to capture the end user's desired service behavior and bundle the component services accordingly and automatically
  - Policy may hold the answer to this issue

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Creating New Services via Bundling and Composition

- New services are difficult to create
  - Just think about voice services (either VoIP, PSTN, or mobile)
    - Many well-known, successful services
    - However, very few new services in the past 10 years
  - The same question can be asked of data services
    - What's new after Telnet, FTP, E-mail, Web, and IM?
- Why not use a different approach
  - Bundling and aggregation of already existing and successful services
  - Again, industry is doing it already
    - T-Mobile works with AOL
    - NTT DoCoMo works with content providers (i-mode)
    - AOL works with Net2phone
  - However, enabling technology needs to be researched and developed to make this happen

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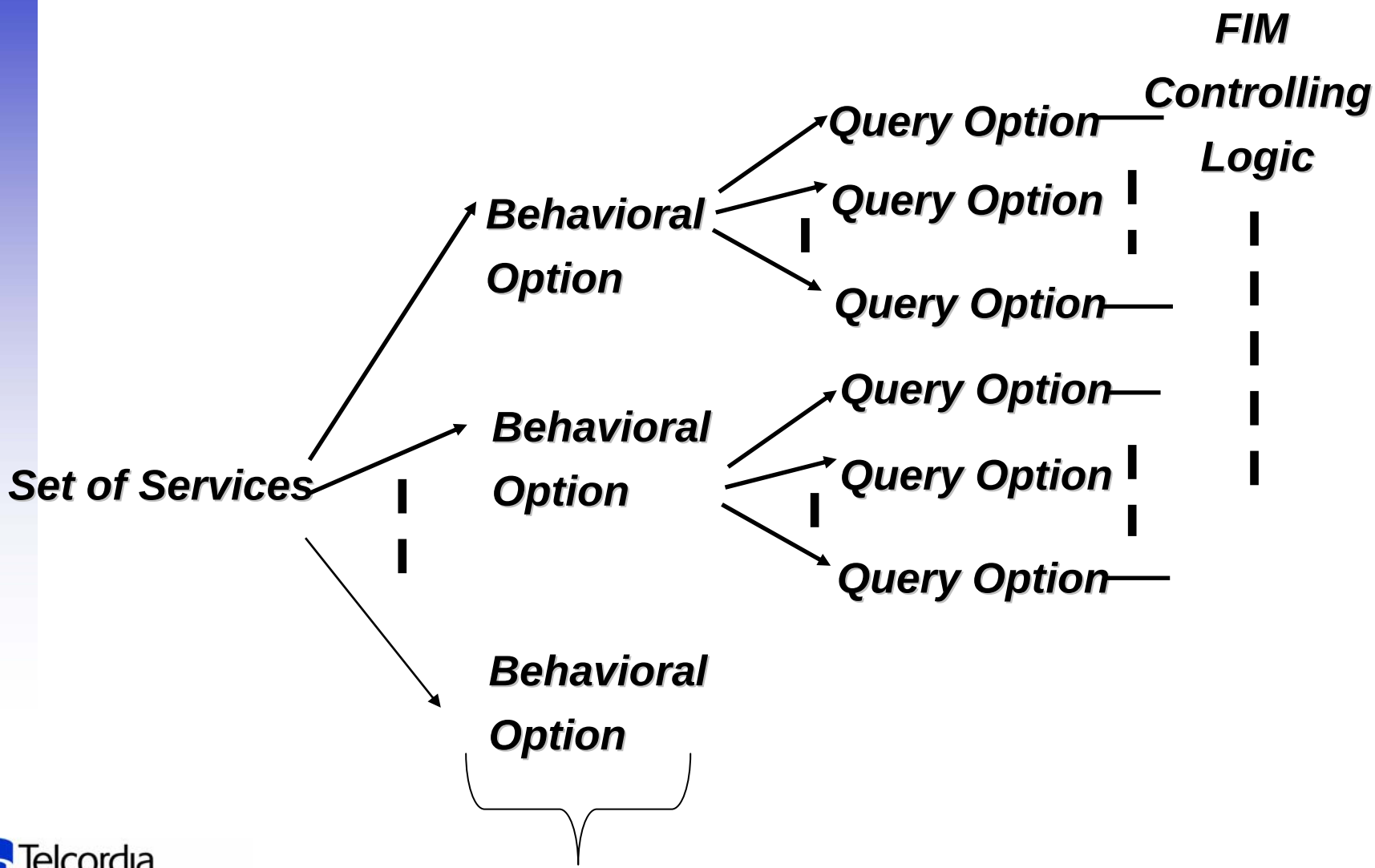
Desired Bundled Service Behavior as Policy



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Enforcement of a Chosen Service Policy by FIM Rule

- **Example** - Subscriber obtains **screening** service from Provider A, **number translation** service from Provider B, **call logging** service from Provider C.
- Two behavioral options are possible based on pair wise behavioral relations*
  - a Screen on dialed digits, Log the call attempt
    - Behavioral Option {S ! NT, S | L, NT -> L}
    - Two Query Options { (S, NT) < L} { S < NT < L}
  - b Screen on translated number, Log successful calls
    - Behavioral Option {NT -> S, S ! L, NT -> L}
    - Only One Query Option { NT < S < L}
- The behavioral options are the service policy specifications!
- The query options are the FIM rules that would enforce a service policy!

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Backup Slide for Behavioral Relations

- **For AIN Release 0.1**, the following behavioral relations are defined:
  - A is independent of B (A | B)
  - B uses information generated by A (A -> B)
  - A can disconnect the call and prevent B from affecting call processing (A ! B)
  - A is incompatible with B (A # B)
- For other application domains, new behavioral relations may be required.

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