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Migrating separate voice and data services to an NGN platform

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Convergence is inevitable

- Voice and data services are traditionally handled by separate network architectures
- Major capex and opex savings may be made by migrating these services to a common NGN platform where individual services are delivered at the edge of the network by multi-service access gateways
- The best strategy will vary according to the design and age of the existing network
- We explore the cost implications of different transition scenarios through a scaleable methodology for modelling these diverse architectures

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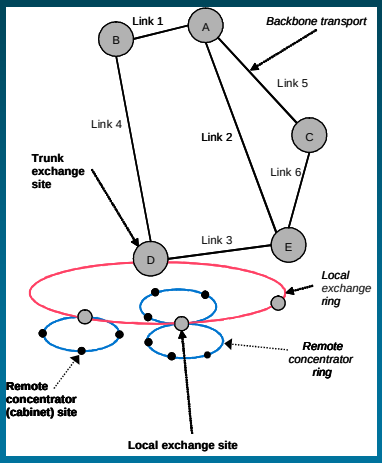
Network topology

- Five trunk exchanges are connected via an SDH backbone with six links
- Local exchanges uplink via local-exchange rings
- Voice customers are connected to local exchanges via remote concentrators and remote-concentrator rings
- Data customers are served directly at local exchanges



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Model granularity

- The five trunk exchanges in the network are modelled individually, but it is not necessary to model every local exchange to compare business-case scenarios
- Assumptions for the local exchanges and access aggregation are averaged over each trunk exchange area
- The model structure for each trunk exchange is automatically generated from a template

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Services and routes

- This reference case only considers three services:
  - voice, 64kbit/s ATM and 2048kbit/s ATM
- Demand is defined for each of the possible routes between the trunk exchanges – defined simply in terms of the endpoints – for example node A to node C
- The intermediate path is captured in a core traffic matrix
- For the five trunk exchanges, there are 15 possible routes, and therefore 15 sets of [3] services

A-A	A-B	A-C	A-D	A-E
B-B	B-C	B-D	B-E	
C-C	C-D	C-E		
D-D	D-E			
E-E				

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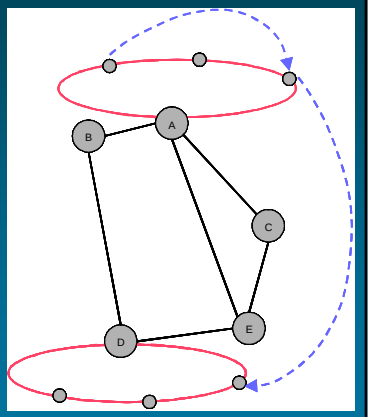
Inter- and intra-node traffic

- Demand is specified for each of the 15 routes, without being specific about individual local exchange sites
- So, for example, traffic for route A–A is from any local exchange on trunk switch A to any local exchange on the same trunk switch …
- … whereas traffic for A–D is from any local exchange on trunk switch A to any local exchange on trunk switch D



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Traffic matrices

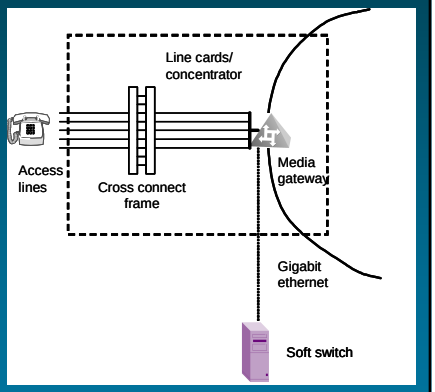
- The traffic generated on the 15 routes is mapped onto the trunk exchanges using an access matrix and a core matrix
- These matrices are used to calculate the traffic on each trunk exchange interface by multiplying the traffic carried for each service by route by the multiplier for the exchange and summing over all services

Migration process

- There are two steps to the migration from the traditional network to NGN:
  - first the IP network is deployed and run alongside the traditional infrastructure while customers are being migrated
  - the legacy network equipment is then removed once the migration is complete

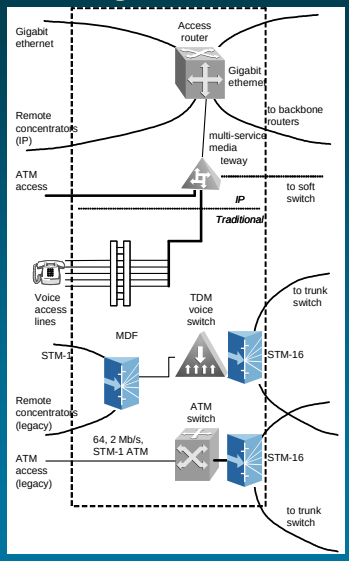
Media gateways and soft switches

- A media gateway is installed at a remote concentrator site, converting TDM circuits to IP and multiplexing them onto a gigabit Ethernet network
- The GigE network is connected to an IP access router at the local exchange
- The media gateway equipment includes new line cards (voice/DSL-capable) and the GigE interface
- A soft switch is deployed at each trunk exchange site, establishing call sessions and identifying destination IP addresses for media packets



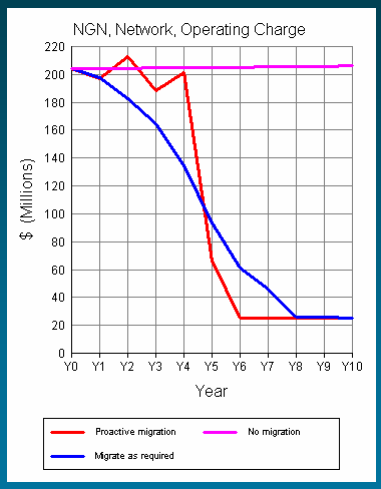
Multi-service media gateways for ATM

- An IP access router is deployed at each local exchange site
- Remote concentrators are connected to this access router via a GigE ring
- Each router is connected to other access routers on the local exchange ring and to the backbone routers via further GigE rings
- ATM access circuits are migrated from the traditional ATM switch to the access router via a multi-service media gateway



Migration scenarios and results

- Three scenarios are modelled:
  - proactive: customers are migrated to the IP network before the end of the traditional network's life
  - migrate-as-required: customers are migrated only when a given access network reaches the end of its life
  - no migration: the legacy networks are maintained, as a base for comparison with the main scenarios
- The key model results are the opex, capex and depreciation for the various networks and scenarios considered



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