ITU / BDT- COE workshop

Nairobi, Kenya,
7 – 11 October 2002

Network Planning

Lecture NP-2.3

Network planning at different time scales, long, medium and short term

Network planning at different time scales:

- **Long term network planning (Target network planning):**

  Target network planning as bases for preparing of comprehensive master plans - master plans are usually based on long term assessments.

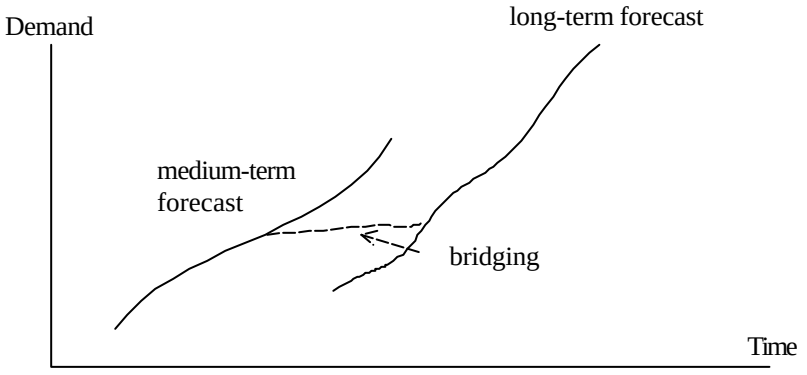
- **Medium term network planning**

  To identify intermediate steps from present to target network.

- **Short term network planning**

  Short-term plans can be made up on regional or local bases.

Demand forecasting as bases for network planning:



Network planning at different time scales as seen in the evolution steps to NGN:

- **In respect to strategies for introduction of the new equipment:**

Consolidation:

Optimize the installed PSTN to reduce capital (CAPEX) and operational expenses (OPEX).
Consolidation can be combined with a selection of future-safe products to prepare migration to NGN

Expansion:

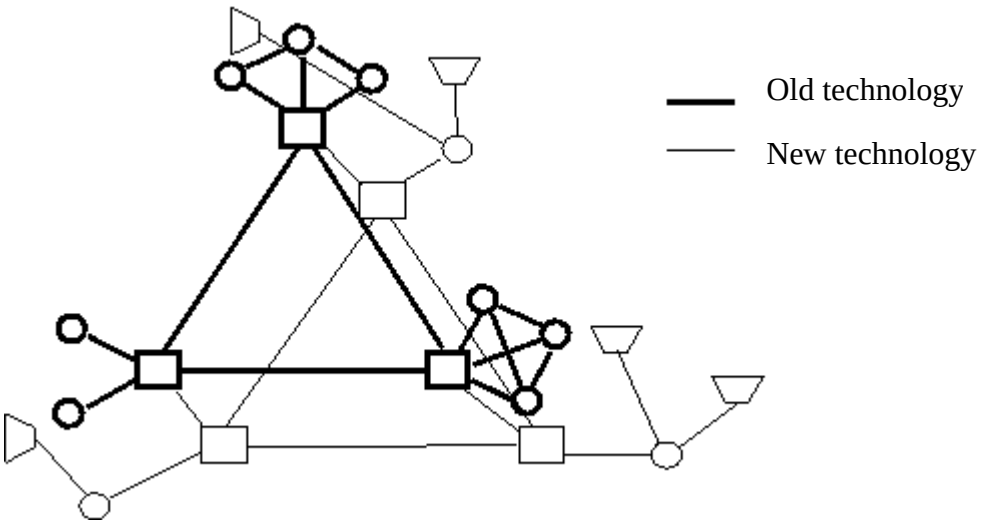
Keep the existing PSTN infrastructure and services, but introduce an overlay NGN (based on broadband access) for addressing new customers and introducing new services (e.g., multimedia).

Replacement:

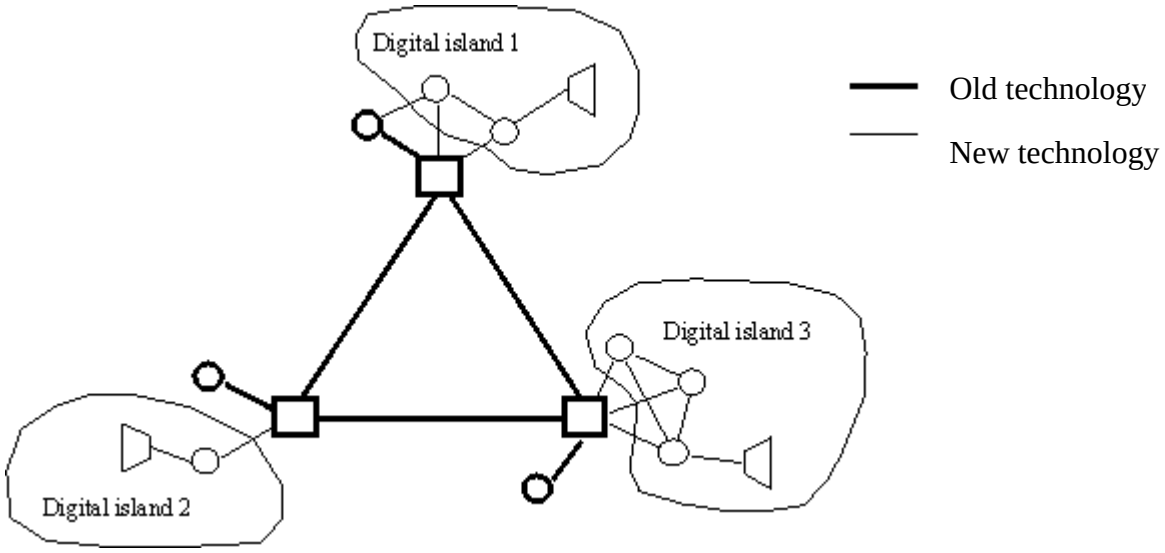
Replace PSTN components (at their end-of-life) with equivalent NGN components.

- **In respect to strategies for coexisting of the present and future technology:**

Overlay strategy

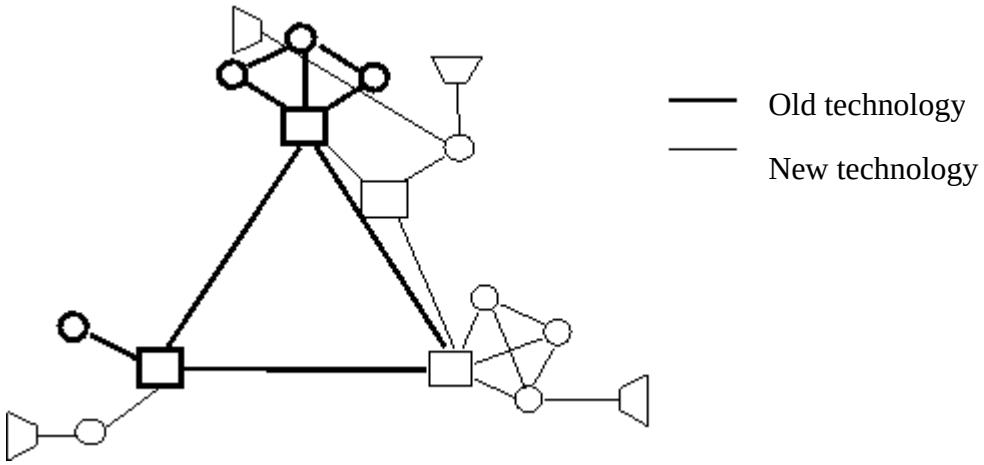


Island strategy



Island strategy

Pragmatic strategy, where we have layers **and** islands.



Subscribers potential

Based on statistics for population, average house-hold size, average teledensity, residential teledensity and teledensity per house-hold.

Reference to Cellular mobile teledensity and impact on fixed network.

Ratio residential to business subscribers.

Teledensity statistics for highly developed countries (from year 2000)

Country	Population (in thousands)	Teledensity [%]	Residential Teledensity [%]	Average house-hold size	Teledensity per house-hold [%]	Cellular mobile Teledensity [%]
Australia	**19,157**	**52,46**	**73,0**	**2,64**	**101,2**	**44,69**
Canada	**30,750**	**67,65**	**63,4**	**2,65**	**98,2**	**28,46**
France	**58,892**	**57,93**	**74,0**	**2,46**	**94,0**	**49,33**
Germany	**82,260**	**61,05**	**77,0**	**2,16**	**95,5**	**58,60**
Italy	**57,298**	**47,39**	**67,1**	**2,71**	**96,9**	**73,73**
Japan	**126,919**	**58,58**	**73,9**	**2,70**	**116,8**	**52,62**
New Zealand	**3,831**	**49,99**	**70,8**	**2,91**	**103,0**	**56,33**
Republic of Korea	**47,300**	**46,37**	**74,6**	**3,04**	**105,5**	**26,82**
Spain	**40,600**	**42,12**	**74,5**	**3,25**	**100,8**	**24,74**
Sweden	**8,881**	**68,20**	**65,3**	**2,22**	**98,7**	**71,72**
Switzerland	**7,204**	**72,67**	**68,0**	**2,02**	**99,6**	**64,39**
United Kingdom	**59,766**	**58,86**	**70,1**	**2,38**	**93,0**	**72,70**
United States of America	**275,130**	**69,97**	**65,8**	**2,58**	**94,1**	**39,79**

Average household size in the highly developed countries – from 2,0 to 3,4

Ratio residential to business subscribers - about 3 to 1

Teledensity per house-hold in the highly developed countries around 100|%

Impact of Cellular mobile on residential teledensity:

Case of Italy:

Year 1997: average teledensity **44,68 %** , residential teledensity **76,5 %**

Year 2000: average teledensity **47,39 %** , residential teledensity **67,1 %**

Teledensity statistics for different countries in the world (data from year 2000)

Country	Population (in thousands)	Teledensity [%]	Average household size	Teledensity per household [%]	Cellular mobile Teledensity [%]
Argentina	**37,032**	**21,32**	**3,71**	**68,7**	**16,34**
Brazil	**170,115**	**18,18**	**3,78**	**41,6**	**13,63**
Bulgaria	**8,225**	**35,04**	**2,83**	**84,6**	**8,97**
China	**1,295,330**	**11,18**	**3,72**	**33,9**	**6,58**
India	**1,012,396**	**3,20**	**5,44**	**-**	**0,35**
Indonesia	**212,029**	**3,14**	**4,34**	**11,3**	**1,73**
Iran	**63,661**	**14,90**	**4,59**	**56,1**	**1,51**
Kenya	**30,669**	**1,05**	**3,22**	**1,4**	**0,42**
Mexico	**98,881**	**12,47**	**4,60**	**42,0**	**14,24**
Morocco	**28,351**	**5,03**	**5,43**	**21,0**	**8,26**
Pakistan	**141,256**	**2,16**	**6,02**	**9,8**	**0,25**
Peru	**25,662**	**6,69**	**4,63**	**25,0**	**4,96**
Philippines	**76,499**	**4,00**	**5,01**	**14,0**	**8,44**
Russia	**146,934**	**21,83**	**2,83**	**48,7**	**2,22**
South Africa	**43,686**	**11,36**	**4,39**	**27,9**	**19,02**
Sudan	**31,095**	**1,24**	**6,07**	**5,7**	**0,07**
Thailand	**60,607**	**9,23**	**3,87**	**24,2**	**5,04**
Turkey	**65,700**	**28,0**	**4,56**	**97,0**	**24,56**
Uganda	**22,210**	**0,28**	**4,85**	**0,5**	**0,85**

Source: Year book of Statistics, Telecommunication Services 1991 ~ 2000, ITU, December, 2001

Average household size for the selected countries – from 3,1 to 6,4

Example of calculated subscriber potential for some countries, based on the above estimation :

Brazil: 54,8 Million (34 %) potential teledensity

China: 447 Million (35 %) potential teledensity

Russia: 64 Million (43 %) potential teledensity

South Africa : 12,4 Million (29 %) potential teledensity

Teledensity statistics for some LDCs (data from year 2000)

Country	Number of subscribers	Teledensity [%]	Average household size	Teledensity per household [%]
Angola	**96,350**	**0,78**	**5,1**	**-**
Eritrea	**27,375 ***	**0,68**	**5, 0**	**1,8**
Ethiopia	**194,494**	**0,30**	**4,2**	**0,7**
Guinea	**44,046**	**0,55**	**4,2**	**0,6**
Lesotho	**23,144 ***	**1,00**	**5,2**	**2,0**
Malawi	**41,362 ***	**0,37**	**7,9**	**1,2**
Myanmar	**229,320**	**0,48**	**5,0**	**-**
Tanzania	**150,141**	**0,45**	**5,5**	**1,0**
Solomon Islands	**7,860**	**1,95**	**7,1**	**2,0**
	* only fixed subscribers			

There is still considerable potential of telecom subscribers in the world, concentrated primarily in the developing countries and after all in the LDCs

Planning in the developing countries for a long period will primarily have to solve problems of huge network expansion, so long-term (target) network planning will be essential task.