## Take-aways and Conclusions

1. Appreciation of SP's perspective managing large scale networks. Non linearity- amplifications that happen at large scale do not show up at small and medium scale.

2. Trying to optimize large-scale networks leads to tighter inter-dependence and increased complexity. This will be prominent in future networks. The additional challenge of providing services beyond best effort with stringent QoS has to be met.

3. SK telecom's vision of replacing fiber access with 5g/terahertz wireless access to solve low latency communication over air for new services.

4. Cox communications provided perspective on differences in how we access Internet has evolved due to change in end-user devices, there is continuous higher bandwidth demand and will continue to grow.

5. Leverage what we have (e.g. use ipv6 addressing) to a certain limit but also explore newer technologies. Software cannot alone provide all solutions, access should be gigabit to home, keep access simpler

## Suggestions for FG NET2030

➢ Need to look into the future Internet capabilities - Accessing from anywhere (air, ground), High speed access at cities, application-aware QoS, protected and limited user data travel with user, ML and AI.

➢ Need to look into the future Internet Technologies - support future applications, interoperability with current technologies, expect to keep IPv6 addressing, simplified devices, support secure and intelligent internet.

➢ Need to look into how future Internet can meet critical latency demands.

➢ Need to consider different roles of edge network, access network and core network.

## Take-aways and Conclusions

1. Largest cities are expected to develop in Africa and Asia in 2025 and beyond. More people from urban areas will move into cities.

2. Smart cities are expected to have enormous number of sensors, edge computing resources and require data analytics.

3. Smart cities requires holistic process optimization including low noise, low gas emission, etc.

4. Smart cities will have smart factories as part industry 4.0

5. Telepresence is expected to be an important applications in the future.

## Suggestions for FG NET2030

➢ Smart city applications need to be considered in defining future internet requirements and technologies.

➢ Telepresence needs to be considered in defining future internet requirements and technologies.

## Take-aways and Conclusions

1. Protocol evolution.

2. Different types of delays along the packet travel trip.

3. Challenges for future networks. (Architecture, requirements, extra value, connect the unconnected communities, technological leap).

## Suggestions for FG NET2030

➢ Revisit the access ring topology concept)

➢ Segment transport protocol beside think of innovative ideas for reintroduce the ring topology).

➢ Focus on decreasing digital delays) beside signal propagation delay.

➢ Classification for the challenges according to criticality then propose a workarounds for each to avoid flooding.

## Take-aways and Conclusions

1. Silicon improvements driving performance increases

2. Existing wiring technologies may scale to support future internet requirements

3. Network slicing usage case for control and management plane

4. Those who don't study history are destined to repeat it

## Suggestions for FG NET2030

➤ Study past, present and possible future for silicon capabilities as related to network transmission speeds both in custom ASIC and x86

➤ Future network must be based on legacy wiring in addition to wireless networks

➤ Separation of control, management and data plane should be considered

➤ Perfect is the enemy of good enough, but don't give up on driving future technologies