

Some long term questions to WGs/SIGs

□ Services

- ⇒ How to make services human (artificial intelligence based business logic)?
How can services learn to adapt and to evolve ? (WG1,2,6)
- ⇒ How to integrate a 'World model/knowledge' into services to become more intelligent ? (WG1,2,SIG3)
- ⇒ How components of services may form individualized services (on demand, task-driven, autonomously) ? (WG2,SIG3)
- ⇒ What kind of requirements come from the needs of different societies ?
(industrial and developing countries, religions etc.) (WG1)
- ⇒ The proliferation of content and services even now are overwhelming the human being. How can we cope with it in 10 years ? (WG1,2,6)
- ⇒ We will be surrounded by intelligent objects in the future. How can proactive services be defined based on presence of these objects ? (WG1,2,6,SIG3)
- ⇒ How can we deal with traditional boundaries like countries, organizations, and business domains in such a dynamic environment w.r.t seamless service provisioning, security, accounting, billing, QoS, etc.? (WG2,6,SIG2)

□ System

- ⇒ How to increase dependability of systems? (SIG2)

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- Terminals / End user systems
 - ⇒ How is work divided between terminal and network ? (WG2,6,SIG3)
 - ⇒ The cellular terminal becomes a gateway between surrounding sensors networks and back offices, a router for ad-hoc communication, an end system. What is the structure of such a terminal ? (WG2,6,SIG3)
 - ⇒ How can we ensure that people switch between terminals like they change clothes ? (WG1,2,6)
 - ⇒ Do we consider only user equipment being primarily a data sink, or also a data source ? (WG2,5)
 - ⇒ How many links do we expect per device ? (WG3,5,6)
 - ⇒ How many devices per user ? (WG3,5)
 - ⇒ What density of embedded devices in the environment ? (WG2,3)
 - ⇒ What density of users ? (WG5)
 - ⇒ What is the relationship between connectivity and storage? If we have "sufficient" connectivity, do we ever need storage? If we have "sufficient" storage, how much do we need to do with connectivity? (WG2)
 - ⇒ Device administration (user/network-provider/other)? (WG6)
 - ⇒ How to reduce (or administrator) "obvious" or "learnable" interaction without reducing control? (SIG3)
 - ⇒ How to allow more abstract and "human" user control? (SIG3)
 - ⇒ How to allow devices, networks, services and applications to configure themselves (securely) and adapt to expected and catastrophic change? (SIG3)

Some long term questions to WGs/SIGs

□ Networks

- ⇒ Will ad-hoc wireless networks take over fixed networks ? (WG3,SIG3)
- ⇒ Do backbones have a future with gigabit over wireless ? (WG3,5)
- ⇒ Will IP Vx remain the network morpheme ? (WG3)
- ⇒ With ubiquitous composability of P2P services, is the protocol stack collapsing ? (WG3,SIG3)
- ⇒ With proliferation of non-layered (cross layer optimized) architectures will we move towards protocols on demand ? (WG3,6,SIG3)
- ⇒ What is the role of broadcasting/multicasting in the wireless world ? (WG3)
- ⇒ Will security and privacy issues be sufficiently dealt with? (WG3,6,SIG2)
- ⇒ Flexible partitioning of functionality to network elements? (WG6)
- ⇒ What is the impact of embedded networking, and how do we attach sensor networks to present infrastructure? (WG3)
- ⇒ How do we provide self-organization and autoconfiguration to *all* levels of networking (WG3)
- ⇒ How do we provide flexibility, robustness and simplicity same time? [what we can learn from active networking and programmable networking research so far] (WG3)
- ⇒ What is the future interplay with Wireless and Fixed Networks? (WG3)
- ⇒ (Wireless) QoS? What, When, How? (WG3)
- ⇒ What are the performance implications of heterogeneous multihop wireless networks? (WG3)
- ⇒ The future of end-to-end principle? (WG3)

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- Radio or access systems
 - ⇒ Which parameter ranges in terms of peak, average and minimum data rates are feasible with respect to range, available bandwidth and frequency ranges? (WG4,5,SIG1)
 - ⇒ Flexibility of a radio interface (WG4,6,SIG3)
 - ⇒ Flexibility to support different deployment scenarios (WG4,3,6)
 - ⇒ Scalability of a radio interface (WG4,6)
 - ⇒ How close the laws of physics can be achieved ? (WG4,5)
 - ⇒ What is the definition of end to end efficiency ? (WG4)
 - ⇒ What technical measures will be most efficient to reduce the radio exposure of humans to the largest possible extent ? (WG4)
 - ⇒ Is the E_b/N_0 an appropriate measure to evaluate the radio exposure of humans when going for broadband radio transmission ? (WG4)
 - ⇒ Should a method to estimate the future spectrum needs of B3G systems assume granted the most advanced technologies available to use the signal space efficiently or should the spectrum needs be estimated based on robust and power efficient air interfaces (the former approach might result in no needs for any more spectrum for B3G systems at all) ? (WG4,SIG1)
 - ⇒ Since spectrum comes with standardized air interfaces, what is the chance of success of 3G for hot spots/areas compared to wireless broadband systems following IEEE 802.11/16/20 standardization ? (WG4,3,5,SIG1)
 - ⇒ Since broadband media don't provide the same value of information per bit transmitted than is the case for the speech service, how to provide wireless broadband data with a much less cost per bit (factor 100-1000 less) compared to existent and forthcoming mobile cellular air interfaces (WG4,5)
 - ⇒ Smart antenna technology adds substantial complexity to a given radio system thereby improving the capacity substantial. The tradeoff is to evaluate between a small number, say $x = 2$ antenna array elements, to provide most of the diversity related possible capacity gain with low related cost compared to a system using $x > 2$ but having much higher complexity, power consumption and cost ? (WG4,5)
 - ⇒ What is the likely impact of cognitive radios ? (WG4,6,SIG1)