5G Reimagined: A North American Perspective

November 2015

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Abstract

The purpose of this white paper is to understand, define, and advance North American requirements for 5G. Deployment scenarios and use cases for 5G networks are analyzed from a North American perspective. These use cases include both traditional and more disruptive service scenarios. The scope of the use cases is not limited to narrowly defined mobile network, and includes interactions with other components.

The white paper identifies unique characteristics of the North American network and regulatory requirements. Although the focus is on the North American market, it is considered in a global context to leverage synergies wherever possible, and to only identify new requirements where necessary.

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ATIS 5G Ad Hoc White Paper

1 Scope & Purpose

1.1 Scope

The scope of this white paper is to understand, define, and advance North American requirements for 5G. The white paper describes use cases which show, from a North American perspective, possible scenarios for 5G networks. These use cases include both commonly recognized baseline requirements and also more disruptive service examples representing a more challenging conception of aspects of 5G. The scope of the use cases is not limited to just the narrowly defined mobile network. Many of these cases include interactions with other elements, including some not normally standardized, such as content provider applications/networks, operational systems within a carrier network and traffic scheduling and steering algorithms.

Based on the documented use cases, the white paper identifies unique characteristics of the North American network and regulatory requirements. Although the focus is on North American requirements, these are considered in a global context to leverage synergies wherever possible, and to identify new requirements only where necessary.

1.2 Business Purpose

Modern wide area wireless systems were originally introduced as a complementary technology to fixed networks. The initial business model and engineering were designed around the assumption that they would only be used for very occasional high value calls. With each subsequent generation of wireless technology the underlying assumptions changed in terms of traffic volume, service mix, and the role of mobile data. As we enter the era of 5G we see that wireless connectivity is becoming the default mode for many types of users and devices. Wireline subscriptions are declining as users move to a predominantly wireless model. To deal with this emerging service reality, 5G technology must provide a platform for cost-effective provision of high bandwidth, low latency services to the whole range of users.

In 5G we aim to develop a system that is fit for purpose, in a business sense, for the future mix of users and services. Evolution of existing wireless and wireline technologies has created a situation where meeting the full range of modern services requires multiple technology silos to be combined and overlaid in an ad-hoc fashion. As the market drives ever increasing user expectations, this approach is ceasing to be viable. User expectations and increasing service demands will require a coherent approach to technology deployment.

This report explores in detail particular business opportunities and requirements for the 5G network. We aim to provide a unified platform for existing services and also address emerging opportunities including:

- PSTN evolution and wireless PSTN substitution;
- Massive IoT and M2M applications;
- Critical communications; and
- Enhanced mobile broadband.

2 Definitions

For a list of common communications terms and definitions, please visit the *ATIS Telecom Glossary*, which is located at < http://www.atis.org/glossary >.

2.1 5G System: In previous generations of wireless technology, functionality was primarily provided by network equipment, and devices were simply used to access network functionality. As a result, it was usual to refer to “the network”. However, in the case of 5G it is recognized that the boundary between functionality provided by the