Global Standardization In Telecommunication & IT

August 19, 2004

Beijing

Presentation Overview

Benefits of global standards

Choice in global standards

A brief look at some international SDO's

General principles in standards development

A quick overview of QUALCOMM, Inc

QUALCOMM's participation in international SDO's

QUALCOMM in China

Conclusions

Benefits of Global Standards (1)

Telecom and IT standardization:

- Deploys new technologies quickly and more easily
- Ensures interoperability
- Increases service quality / reliability
- Increases deployment / operations flexibility
- Lowers service / equipment cost
- Minimizes customer frustration
- Provides industry joint planning

Benefits of Global Standards (2)

Industry is moving from national to global standards

Global standards benefit industry & consumer

- Decrease cost for everyone
- Provide for economies of scale
- Allow for more rapid deployment of technology

Standards facilitate trade

- Exporters of products with international standards reach more markets
- Importers of products with international standards get more products faster and cheaper with a wider choice of suppliers

Choice in Global Standards (1)

Standards decisions are best left to the market place:

- Companies best know which technologies meet the needs of their customers
- Government policies cannot keep up with the rapid pace of change in technology
- Most telecom and IT standards used globally have been created with little or no government involvement

Choice in Global Standards (2)

This is not to say governments have no role

For example, US government is involved in standards as:

- A participant in standards development (generally as an observer)
- The implementer of trade policy
- The regulator
- An end user (procurement)

However, standards development and deployment are driven by commercial interests

Choice in Global Standards (3)

Ideally, goal is direct adoption of international standards

The fall-back is to adapt international standards to serve national needs.

- In rare cases, may be required for regulatory issues
  - *For example, number portability, E-911*

Followed by the development of national standards

- this is the exception not the rule

International Standards Bodies

ITU is the "pre-eminent" global standards developer for telecommunications

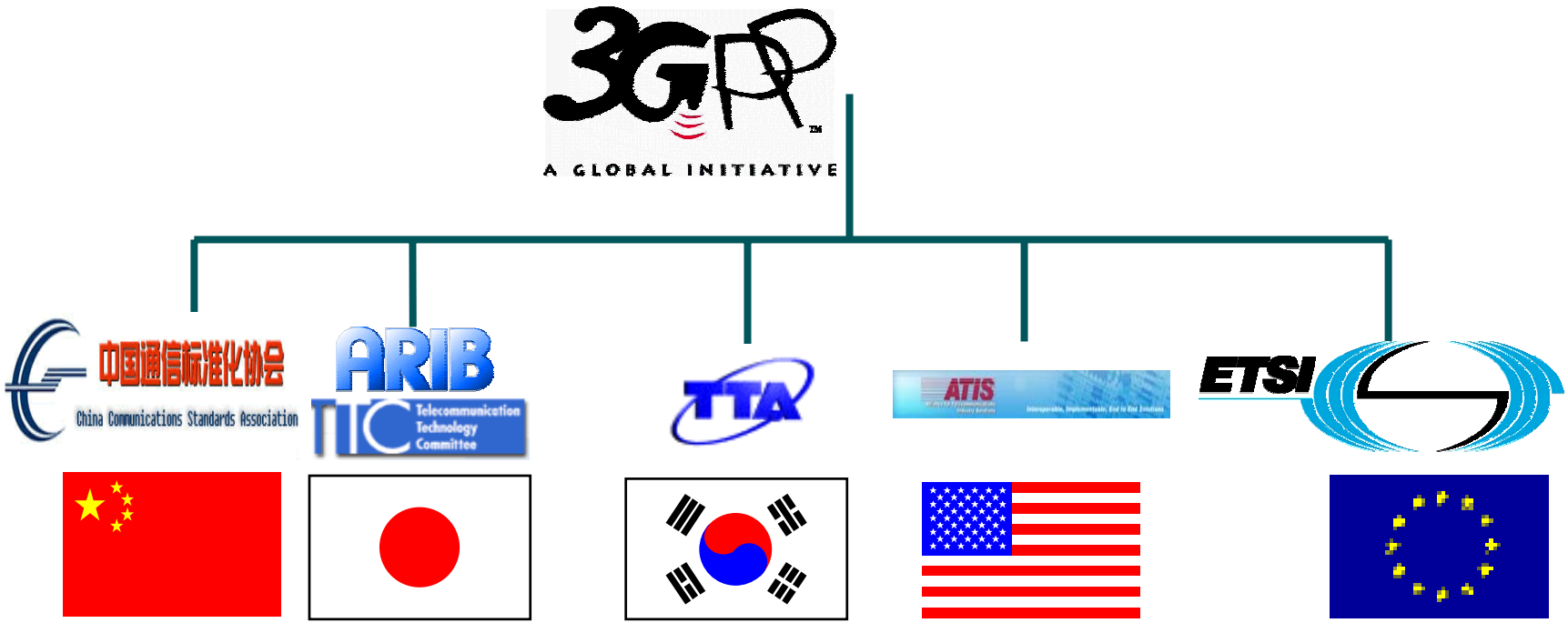
Other developers of international standards

- International Organization for Standardization (ISO)
- International Electrotechnical Commission (IEC)
- Joint Technical Committee 1 (JTC1) which addresses Information Technology (ISO + IEC)

Some fora and consortia operate at global level

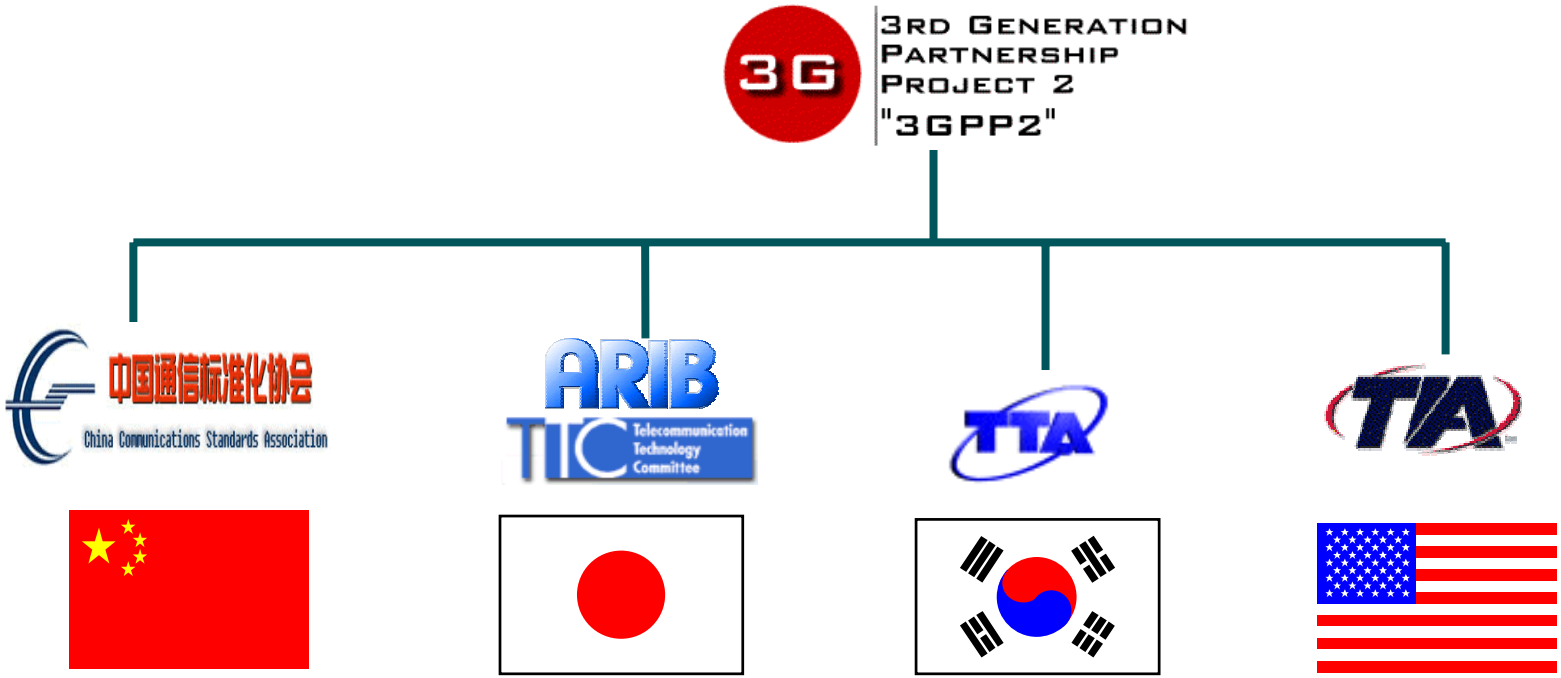
- Internet Engineering Task Force (IETF)

IMT-2000: 3GPP



CCSA	China Communications Standards Association (China)
ARIB	Association of Radio Industries and Businesses (Japan)
TTC	Telecommunication Technology Committee (Japan)
TTA	Telecommunications Technology Association (Korea)
ATIS	Alliance for Telecommunications Industry Solutions (USA)
ETSI	European Telecommunications Standards Institute (Europe - CEPT)

IMT-2000: 3GPP2



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ARIB	Association of Radio Industries and Businesses (Japan)
TTC	Telecommunication Technology Committee (Japan)
TTA	Telecommunications Technology Association (Korea)
TIA	Telecom Industry Association (USA, Canada, Mexico)

Principles of Standards Development

Most global standards developers agree on the following common principles:

- Openness to all interested parties
- Transparency in procedures
- Procedures for appeal
- Fair treatment of intellectual property
- Consensus-based work methods
- Industry-led activities

QUALCOMM As an Example

Let's look at QUALCOMM, Inc. as an example of:

- How a company like QUALCOMM, Inc. becomes a primarily intellectual property driven organization, particularly if that organization is no longer primarily a manufacturer
- What kind of role a company like QUALCOMM, Inc. can play in the industrial value chain
- How would a company like QUALOMM, Inc. rely on international standardization for promoting its technologies and gaining markets (such as China)

Quick Overview of QUALCOMM, Inc.

World-wide leader in developing and delivering innovative digital wireless communications products and services based on the Company's CDMA digital technology

Consists of the following divisions:

- QCT (QUALCOMM CDMA Technologies)
  - Delivers CDMA-based IC & system S/W for wireless comm. & GPS products
- QTL (QUALCOMM Technology Licensing)
  - Grants licenses to use Company's IP portfolio
- QWI (QUALCOMM Wireless & Internet)
  - QIS: BREW™; QWBS: OmniTRAC™; QDM: Digital Media
- QSI (QUALCOMM Strategic Initiatives)
  - Makes strategic investments to promote CDMA world wide

QUALCOMM in China (1)

China CDMA Industrial Value Chain

QUALCOMM participates in every link of the chain

New M-Data Business Value Chain

Operator Takes Leadership

Technology Platform Vendors → Infrastructure & Equipment Vendors → Application Platform Vendors → Application Developers → Content Providers → Content Aggregators → Mobile Portal Providers → Mobile Network Operators → Handset Vendors

Technology Platform Vendors: QUALCOMM

Infrastructure & Equipment Vendors: Motorola, Lucent, Nortel, Ericsson, Samsung, ZTE

Application Platform Vendors: Huawei Technologies

Application Developers: ISP, ICP, ASP

Content Providers: Mobile Operator "M-PORTAL"

Content Aggregators: 網易 NetEase www.163.com, byair.com 新网, sina 新浪网 www.sina.com.cn, 搜狐 SOHU.com, Newpalm, SEGA, mp3.com, ToySoft, Glossa, nuvo studios, 联通 UNI-INFO 在信, 165 联通 UNI-INFO 在信, 联通 新时空 CDMA

Mobile Network Operators: 中国联通 CHINA UNICOM

Handset Vendors: Samsung, LG, ZTE, Motorola, Toshiba, Sanyo, Kyocera, Soutec, HiSense, Capital, Haier, Bird, Konka, TCL, Eastcom, Xoceco

QUALCOMM in China (2)

9 CDMA infrastructure equipment and 18 CDMA handset manufacturers are QUALCOMM Licensees in China

	Subscriber Equipment	Infrastructure Equipment
	Amoi Mobile Co. Ltd.	
	Beijing Telecommunications Equipment Factory	Beijing Telecommunications Equipment Factory
	CEC Telecom Co., Ltd.	
	Dalian Daxian Group Co. Ltd.	
	Dalian Huanyu Mobile Technological Co. Ltd.	Dalian Huanyu Mobile Technological Co. Ltd.
	Datang Telecom Technology Co., Ltd.	Datang Telecom Technology Co., Ltd.
	Eastern Communication Company Ltd.	Eastern Communication Company Ltd.
	Guangzhou Southern Hi-Tech Co., Ltd.	Great Dragon Information Technology Corp. Ltd.
	Haier Group Company	Guangzhou Jinpeng Group Co., Ltd.
	Hisense Group Co., Ltd.	
	Huawei Technologies Co., Ltd.	Huawei Technologies Co., Ltd.
	Konka Group Co. Ltd.	
	Langchao Electronic Info Industry Group Corp.	
	Legend Mobile Communication Technology Ltd.	
	Ningbo Bird Co. Ltd.	
	TCL Holdings Co. Ltd.	
	UTStarcom, Inc.	UTStarcom, Inc.
	ZTE Corporation	ZTE Corporation

CDMA Handsets Launched in China, ’04

High Tier Handset (Retail Price >3,000 RMB)

Model	SCH-X559	C818D	EX598	V880	A890	C787	CEC688	KZ-870	C777	CU928	SCH-X619	SCP-820	CF16
Manufacture	Samsung	Daxian	Eastcom	Motorola	Motorola	Hisense	CECT	Kyocera	Hisense	Daxian	Samsung	Sanyo	CECT
Photo													
Launch date	Jan-04	Feb-04	Feb-04	Feb-04	Feb-04	Apr-04	Apr-04	Apr-04	May-04	May-04	May-04	May-04	Jun-04

Mid Tier Handset (Retail Price 1,500-3,000 RMB)

Model	CU6660	SCH-X659	3105	815	CU6760	SCH-X609	C510	CU5150	E610	KZ-830	TCL198
Manufacture	LG	Samsung	Nokia	CECT	LG	Samsung	Motorola	LG	Motorola	Kyocera	TCL
Photo											
Launch date	Jan-04	Jan-04	Jan-04	Feb-04	Feb-04	Mar-04	Apr-04	Apr-04	May-04	May-04	Jun-04

Low Tier Handset (Retail Price <1,500 RMB)

Model	ZTEC908	C389	C319	C880	C630	DT520
Manufacture	ZTE	Hisense	Daxian	ZTE	LG	Datang
Photo						
Launch date	Feb-04	Mar-04	May-04	May-04	Jun-04	Jun-04

- *Up to now, there’re over 160 different models on the China CDMA handset market*
- *Including those 30 new models shown above, which are introduced in 2004*

QUALCOMM China's Involvement in Global Standardization (1)

Role of QC China's Standard Engineering Team:

- One of the most important contributors to China communication standard body (CCSA)
- Local observer of QC and international standard bodies
- Consultant to China Unicom on enterprise specifications
- Bridge b/w CCSA/CWTS and international standard bodies

QUALCOMM China's Involvement in Global Standardization (2)

Contributor to CCSA:

Introduce the state-of-the-art technologies to China

- Lead the technical trend
- Help china SDO catch up with the speed of international bodies

Help CCSA/CWTS to localize the latest international standards of wireless communication

- Educate China SDO with the history and background to help them understand and keep in line with international standards
- Help China SDO to clarify the mandatory/optional features with the most feasible technical solutions

QUALCOMM China's Involvement in Global Standardization (3)

Local Observer of QC and Intl SDO's:

Help QC and international standard bodies understand China regulations, specific requirements

- Monitoring the spectrum allocation
- Tracking policy and rules related to radio communication/broadcasting
  - Radio parameter setting to meet China regulation, …

Help QC HQ understand the insight of local-growth new technologies

- Monitoring and tracking TD-SCDMA, SCDMA, local security algorithms
- Following up with emerging new technologies: B3G, WLAN

Bring China specific requirement back to international standard bodies to have international standards support China local requirements

- VPOP, Answer Supervision, …

QUALCOMM China's Involvement in Global Standardization (4)

Consultant to China Unicom on Enterprise Specifications:

Help Unicom specify their own requirements to ensure interoperability

- Unicom's network enterprise specs
- Unicom's handset commercial specs

Introduce new service and enablers to Unicom

Provide technical solutions or consult to Unicom specific requirements

- PRL for EV-DO
- V2 User Plane LBS
- R-UIM, DO Authentication, etc.
- Some of the outcome will be brought to international bodies to standardize as international standards

QUALCOMM China's Involvement in Global Standardization (5)

Bridge b/w CCSA/CWTS and International standard bodies:

Introduce the international standard bodies (e.g. 3GPP2) working process and latest status to China SDO

Encourage and help them to contribute to international standard bodies with China specialty, such as WIN

Circulate the information on international standard implementation status around the world to handle international roaming issue

- "+" code dialing
- PRL setting
- Data roaming
- etc.

QUALCOMM China's Engineering Supports

QUALCOMM China has also been providing:

1. *Network planning and optimization consulting*
   - Leverage from international success cases (VZW, KDDI)
2. *Network and terminal testing supports*
   - CDG (CDMA Development Group)
   - TRAC (Terminal Rapid Acceptance for CDMA)
   - CCF (CDMA Certification Forum)
   - GCF (GSM/Global Certification Forum)
3. *CDMA and UMTS Training*
   - Knowledge transfer in CDMA standards

Conclusions

Global standards benefit everyone

The market should decide what standards are developed and by whom

This approach leads to robust standards and ultimately better products and technology access for consumers

As a technology enabler, QUALCOMM's success relies heavily on global standardization

QUALCOMM's unique business model proves the benefit of global standardization on every link of the value chain

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Thank you!