GCF™

Global Certification Forum

Introduction to GCF Certification

Lars Nielsen, GCF General Manager

IoT Workshop, Shenzhen September 7, 2017

This GCF document is confidential information and subject to copyright protection

©GCF 2017

Mobile drives the world economy… and interoperability matters.

- Mobile has changed the lives of billions of people around the world
- Mobile's impact is based on the adoption of global standards
- In 2016, the mobile industry generated 4.5% of global GDP
- Mobile interoperability helps the global economy communicate more efficiently

GCF Certification: because interoperability matters

GCF
Global Certification Forum

GCF INTRO

Global Certification Forum (GCF)

Operator Members, Associate Operator Members & Subsidiaries

- 3GPP partner organisation supported by Operators, Manufacturers and Test Industry worldwide.
  - 300+ members from across the globe.
- Enables the mobile industry to define a certification process for mobile devices implementing 3GPP radio access
  - 3GPP Market Representation Partner
- Provides the assurance of interoperability and device quality

©GCF 2017

GCF as Legal Entity

- Incorporated as not-for-profit company since 2008
  - Global Certification Forum (GCF) Ltd, UK Company # 6594830
  - Private company limited by guarantee and not having a share capital
  - Objects for GCF are:
    - to provide common means for documenting and assessing compliance, with requirements established by GCF, in Products for all interested industry players, and
    - to capture global recognition and acceptance of the assessed compliance in avoidance of multiple testing and cost efficiencies.
- Owned by the members with a guarantee of 1 £ / member
  - New members must sign Declaration of Participation
  - New members must be accepted by existing members
  - Annual General Meeting & Board Meetings
- Finance
  - Members pay yearly membership fee to fund activities of GCF
  - Annual Accounts is public via the UK Companies House

GCF Global Certification Forum

©GCF 2017

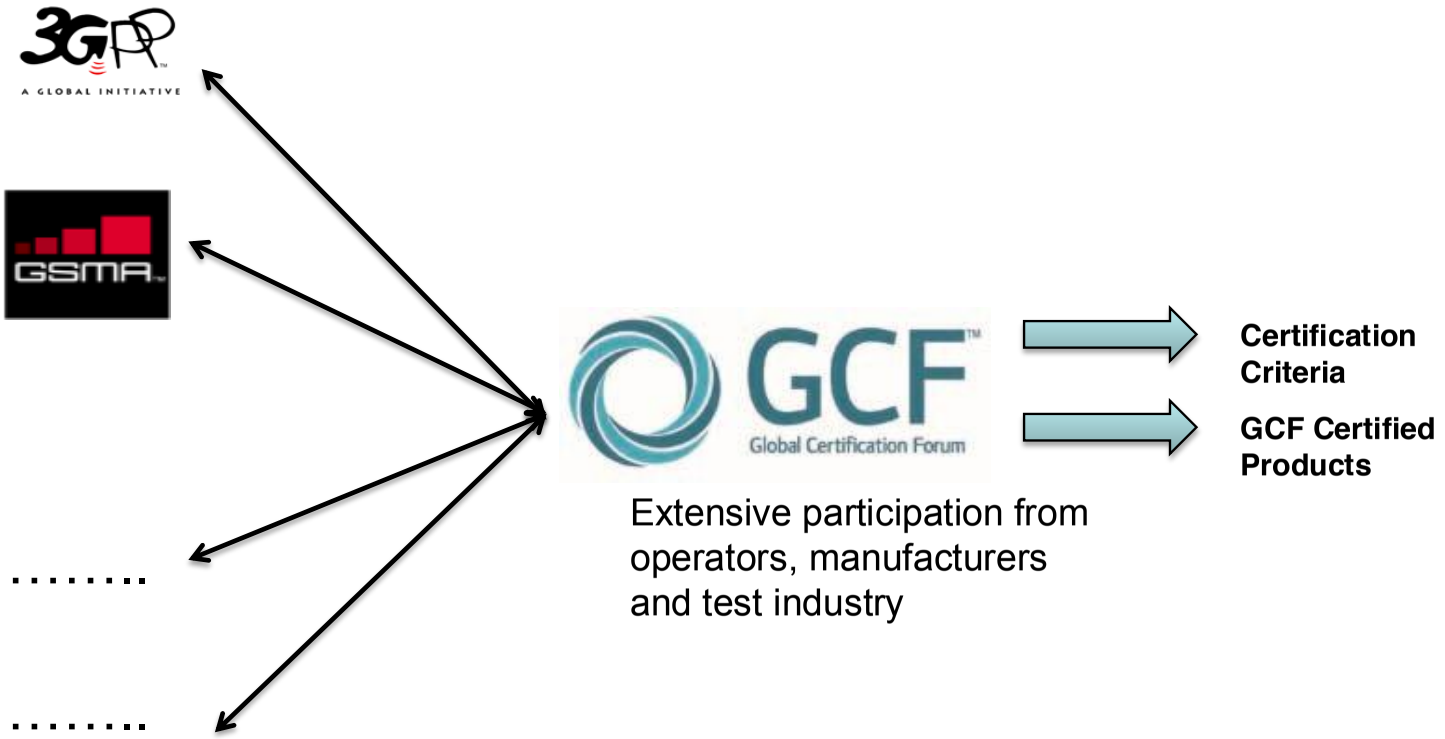
GCF Certification

"Test once, use anywhere"

- Complements regulatory schemes (which focus on spectrum utilisation, EMC, user safety, etc.)
- Certification Criteria based on core standards from SOs
- Scheme has expanded to encompass (amongst others):
  - all 3GPP technologies
  - Currently addressing LTE-Advanced / Advanced Pro, NB-IoT & LTE-M
  - Client Applications and Services e.g. RCS, NFC, RSP (Remote SIM Provisioning)
- Test cases agreed by the industry for the industry
  - Relevant to the real needs of operators and device manufacturers
- Focused on:
  - Providing a platform for harmonisation of testing
  - Avoidance of duplication of testing
  - Reducing testing overheads for manufacturers and operators

GCF
Global Certification Forum

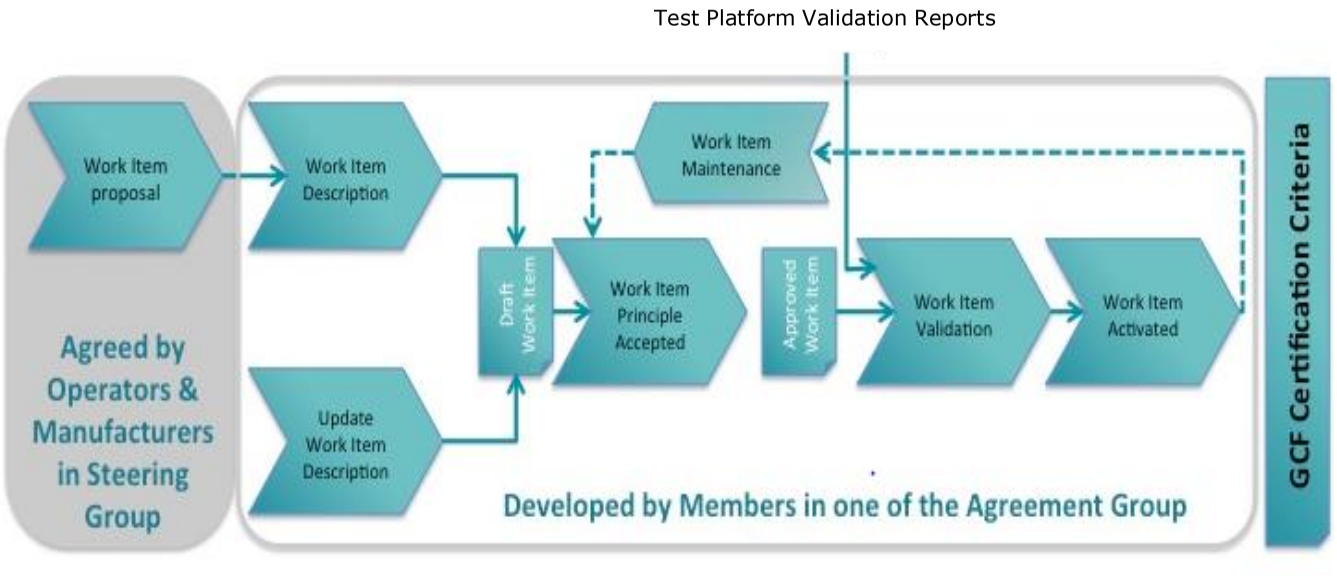
Global Cooperation to Deliver Certification Criteria and Certified Devices



Standards Organisations

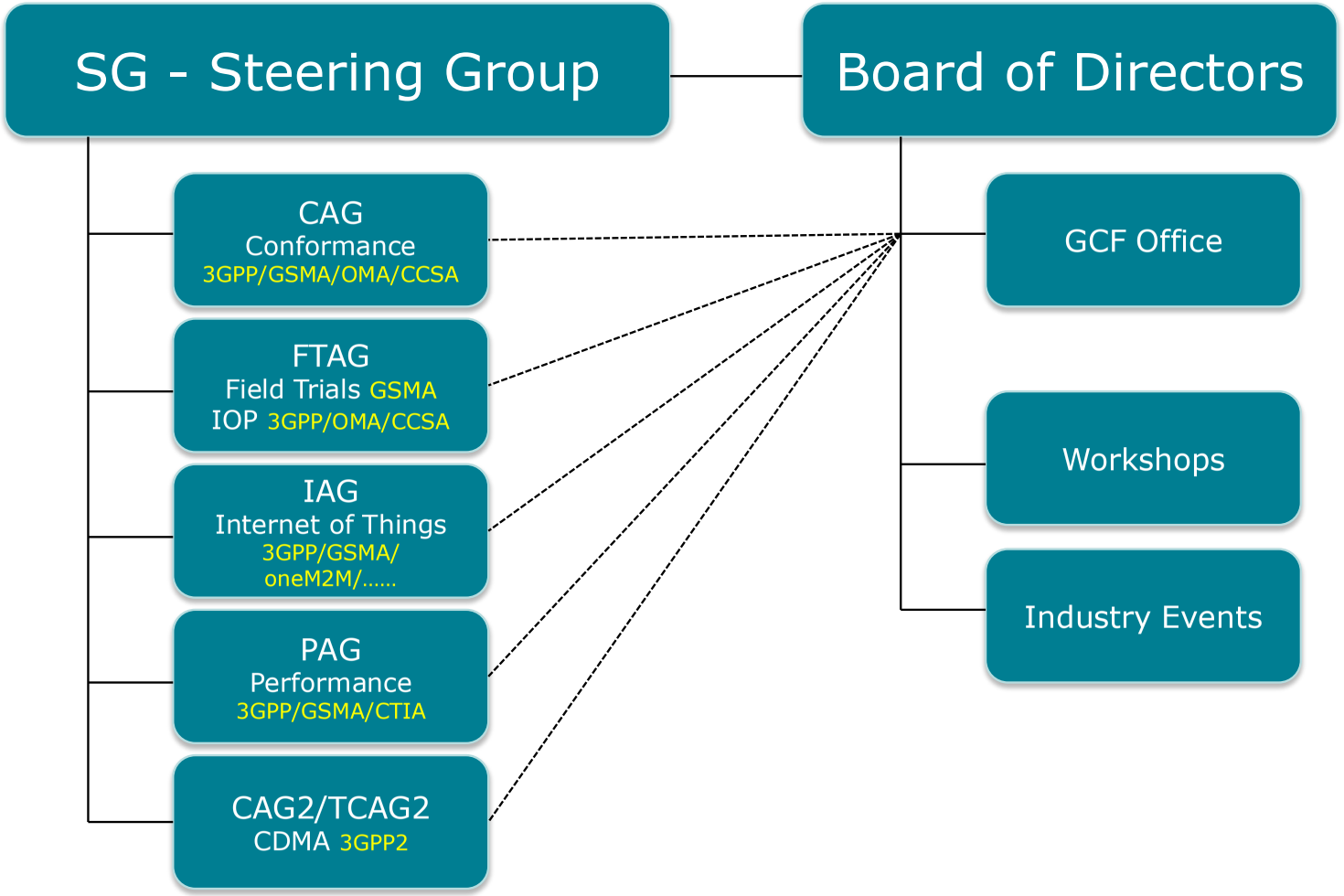
©GCF 2017

Program Evolution



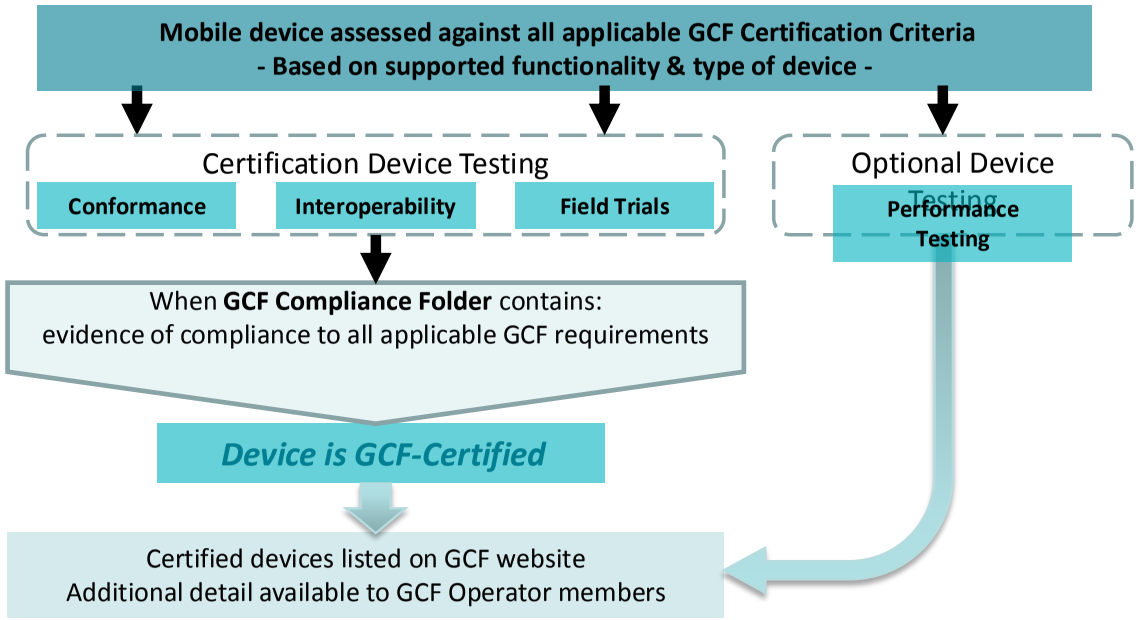
©GCF 2017

GCF's Working Structure



©GCF 2017

The GCF Certification Process



Conformance Testing
(Based upon Standards & Validated Test Cases/Platforms)

Interoperability Testing

Field Trials
(GSMA TS.11)

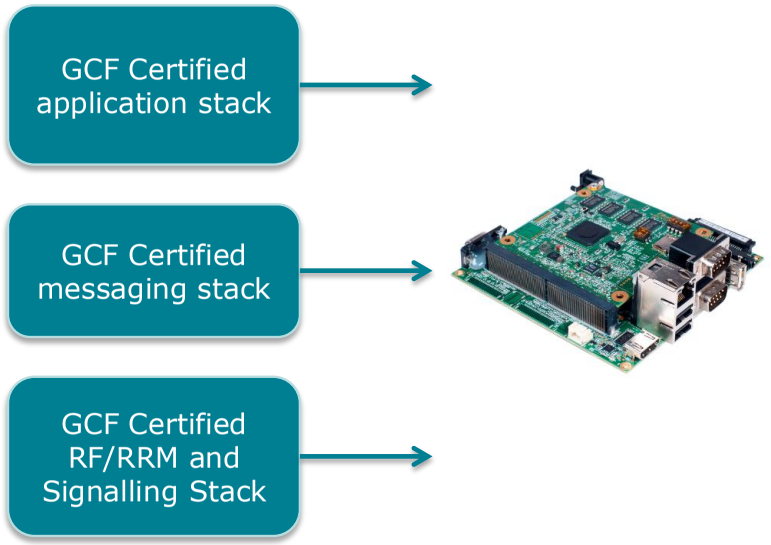
GCF Certified Platforms

Using GCF Certified Platforms helps new manufacturers to

- Have greater confidence that their product will be interoperable with global networks.
- Reduce development costs and get to market quicker.

For baseband chipset and HW/SW stack manufacturers GCF Certifying your platform helps to

- Reduce your customers' integration testing costs.
- Independently demonstrate to your customers that your product is interoperable with networks / infrastructures worldwide.



©GCF 2017

Good cooperation with China Mobile

- From TD-LTE to M-IoT, GCF and China Mobile work together on certification standardization and device quality improvement

- 84 TD-LTE work items activated, GCF certified device supporting of E-UTRA TDD increases rapidly year by year (37%)
- China Mobile declared World's first TD-LTE FTQ to provide field trial
- NB-IoT Work Items (China Mobile as rapporteur) were activated in Q1-2017

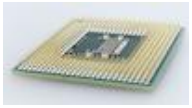
LTE-M AND NB-IOT CERTIFICATION

©GCF 2017

Technical scope of GCF Certification

Scope of RAT assessment

or



Signaling protocol tests

RF and RRM tests

Conformance Testing

Live Network Trials

GSM	UTRA	LTE/ LTE Advanced	M-IoT
• 3GPP R97, R99, Rel-4, EGPRS • A5/2 removal test, A5/3, GEA3. • VAMOS. • Antenna performance	• FDD R99, Rel-4, Rel-5, Rel-6, Rel-7, Rel-8 • HSPA, 64 QAM, MIMO • DC-HSDPA • Ciphering for FDD Rel-7, A5/4 • Fast Dormancy • Priority based reselection. • PPAC • Rx diversity • Antenna performance	• Rel-8, Rel-9 • FDD and TDD Dual mode • ZUC algorithm • IMS and VoLTE • Carrier Aggregation (Rel-10, Rel-11, Rel-12)	• NB-IoT • MTC enhancements (Cat 0, M1) • Enhancements of M-IoT (planned)

< Inter-RAT and Inter-band (protocol) tests >

©GCF 2017

What are LTE-M and NB-IoT?

- Two new 3GPP Rel-13 radio interfaces.
  - LTE-M (Cat M1)
  - NB-IoT (new radio interface)
- Low Power Wide Area Network (LPWAN) designed for Internet of Things (IoT).
- Low power / low data rate / low cost.
- NB-IoT can be deployed in 3 different ways
  - Standalone (in 200kHz bands)
  - Guard Band (in LTE bands)
  - In Band (in LTE bands)

	LTE-M	NB-IoT
Downlink	1 Mbps	250 kbps
Uplink	1 Mbps	20 – 250 kbps
Latency	10 – 15 ms	1.6 – 10s
Duplex	Full or half	Half
Channel BW	1.08 MHz	180 kHz

GCF Global Certification Forum

©GCF 2017

LTE-M and NB-IoT bands in GCF (Conformance) status

LTE-M (CAT M1)

Bands	Status
1	Conformance
3	Planned
5	Planned
7	Planned
8	Planned
13	Conformance
20	Planned
28	Planned
39	Planned
41	Planned

NB-IoT (Led by China Mobile)

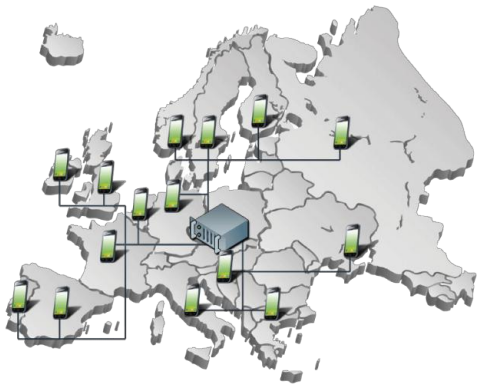
Bands	Protocol	RRM	RF
1 (*)	✔	Planned	✔
3 (*)	✔	Planned	✔
5 (*)	✔	Planned	✔
8 (*)	✔	Planned	✔
20	✔	Planned	✔
28	✔	Planned	✔

First GCF Certified NB-IoT Module in Q1-2017.

* These bands can also be used to prove NB-IoT devices for deployment in GSM and UTRA bands that use the same frequencies.

LTE-M and NB-IoT Field Trials

- Field trials active since Jan 2017
  - Tolerance period active
  - Must use reasonable effort to conduct field trials
- Field Trials based upon GSMA CLP.23 / TS.35.
- Two networks have declared support for NB-IoT Field Trials.
  - DT Germany & VF Germany have declared NB-IoT Support
- GCF is also working with GSMA to understand the opportunities to capitalise on GSMA's Open IoT Labs initiative.



Field Trials

©GCF 2017

New IoT Agreement Group

- GCF has launched a dedicated 'Internet of Things' group.
  - To provide a focus point for agreeing IoT certification criteria and certification processes.

- IoT AG scope
  - Determine IoT industry landscape and build relations with key industry alliances (e.g. oneM2M)
  - Determine features to be assessed.
  - Agree on certification processes.
  - Work with the wider GCF community (solution fit)
  - oneM2M Global Solution

©GCF 2017

GSMA IoT Guidelines

- Many mobile operators are identifying key design characteristics that application developers and IoT service providers need to take into consideration when developing their services

- The GSMA, for example, has developed and released IoT Connection Efficiency Guidelines and corresponding set of test cases under their Connected Living initiative:
  - GSMA TS.34 IoT Connection Efficiency Guidelines v4
  - GSMA TS.35 IoT Device Connection Efficiency Test Book Version 3.0

- While not yet part of formal GCF Certification, discussions are underway with GSMA to see how these test areas can be incorporated as part of overall GCF IoT Certification Program

©GCF 2017

Summary

- Ensuring device – network interoperability is fundamental to the mobile industry and its customers who rely on reliable mobile communication services.
- GCF certification enables device manufacturers to demonstrate their products are interoperable with global networks.
- GCF is open to all operators and manufacturers from the world and to cooperate with all interested parties on interoperability of mobile devices

©GCF 2017

www.globalcertificationforum.org

Certification News

twitter @GCF_Certified

Global Certification Forum

http://www.globalcertificationforum.org/events/asia-events.html

gcf@globalcertificationforum.org

GCF
Global Certification Forum