Smart Metering Implementation Programme

Department of Energy & Climate Change

Solution Design Advisory Group (SDAG)

BIS Conference Centre

23 April 2013

Agenda: SDAG #6
BIS Conference Centre
10:00 Tuesday 23rd April 2013

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No	Time	Subject	Lead
1	10.00 – 10.15	Actions from previous meeting	Colin Sawyer
2	10.15 – 10.45	Consolidated Issues Log - update	Colin Sawyer
3	10.45 – 11.30	PPMID summary of findings	Peter Morgan
4	11.30 – 12.00	Review of GBCS and Use cases	Peter Morgan
5	12.00 - 12.45	ALCS update	Kevin House
6	13.15 – 14.00	Service level performance management	Dominic Gibbeson
7	14.00 - 14.30	ICHI update	Seamus Gallagher
8	14:45 – 15:00	AOB	

1. ACTIONS FROM PREVIOUS MEETING

Colin Sawyer

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SDAG_2.11	**Billing reads:** Npower agreed to inform DECC if they have any residual concerns with billing cycle orchestration & push/pull comments once they have read the Technical Architecture document *Update: AC agreed to provide DECC with information on where processes are misaligned and a list of the risks associated. Complete* *Update: DECC were to respond to the information provided by AC*	26.03.13	AC JH	**Closed** **Open**
SDAG_2.13	**Batching of User requests:** Stakeholders were keen to get a requirement for batch updates of service requests over the DCC User Gateway. DECC agreed to consider if this fitted within the architecture.	23.04.13	JH	**Ongoing**
SDAG_2.15	**Outage reporting**: DECC to talk to Alan Creighton of the ENA to discuss Outage Management requirements and confirm requirements from the ENA and ensure alignment within the CSP schedule 2.1 **Update**: Alan Creighton agreed to write to the Chairman on service levels by 28.03.13.	28.03.13	Alan C	**Ongoing**
SDAG_3.01	DECC agreed to issue product descriptions to SDAG Members when they had been completed		CS	**Ongoing**
SDAG_3.02	DECC agreed to clarify the timetable and prepare the process for GB security extensions.	23.04.13	AA	**Ongoing**
SDAG_3.04	All SDAG members were to review the master issues log and provide any comments to DECC prior to the next SDAG meeting **Update**: It was agreed that the RAID issues that were closed would be sent to the originator to ensure the answer provided closed the original issue satisfactorily.	23.04.13	ALL PH	**Ongoing**
SDAG_3.05	BEAMA agreed to send their concerns on the implications of the security requirements to DECC. **Update**: This is currently being addressed by discussions between SSWG and DECC, these discussions have not yet concluded	23.04.13	Chris S	**Ongoing**

Actions

SDAG_4.02	**HHT Interface**: It was agreed that the description of the Hand Held Terminal interface would be sent to SDAG Members as soon as it was available for review.	23.04.13	JH	Open
SDAG_4.07	**Role Based Access Control:** The Events RBAC would be defined in the GB Comp Spec and feedback would be provided when available.	tbc	MB	Closed (to be agreed)
SDAG_4.08	**Import/Export**: It was agreed that DECC would provide further detail on how the import/export supplies are managed. **Update**: Electricity Export tariff and prices have been considered and excluded at the SMETS2 consultation and drafting stage (i.e. there is no functionality in SMETS to manage Export tariff/price on the meter) thus the UGC will not provide this capability. Should enhanced export functionality be included in specifications in future it will be incorporated into the UGC	23.04.13	MB	Closed (to be agreed)
SDAG_4.09	**Documentation Road-map**: DECC agreed to prepare a documentation road-map (to be finalised when DSP delivery timescales are agreed) - this would include documents that will come from DCC and its service providers to allow DCC users to understand when key design documentation was to be issued.	tbc	CS	Open

| SDAG_5.01	**Design Phase Milestones.** It was agreed that the design phase of the DSP and CSP would be discussed at a future SDAG meeting.	24.07.13	CS	**Open**
SDAG_5.02	**Parse and Correlate approach**. It was agreed that DECC would inform SDAG members on the agreed approach to procuring the Parse and Correlate software at the earliest opportunity.	23.04.13	JH	**Open**
SDAG_5.03	**Parse and Correlate requirements**. It was agreed that DECC would issue the requirements to SDAG members for review	23.04.13	JH	**Open**
SDAG_5.04	**SMETS2 (1st Iteration) Deferred items**. It was agreed that the list of deferred items from SMETS2 (1st Iteration) to SMETS2 (2nd Iteration) would be issued to SDAG members for review	23.04.13	CS	**Open**

2. CONSOLIDATED ISSUE LOG (RAID) - UPDATE

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SDAG Open Issues

Outstanding issues
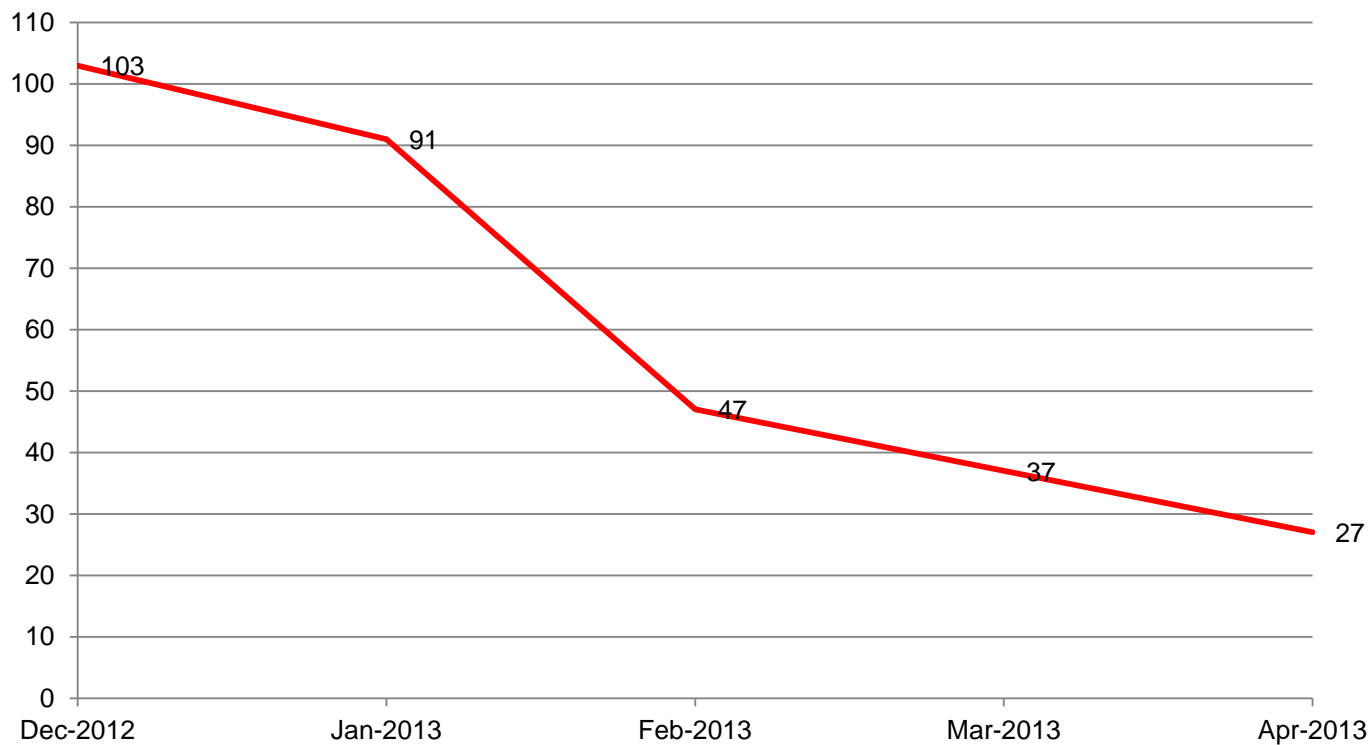
- HAN

- 868 development

- ALCS

- Parse and Correlate

- Detail defining the functionality of each component of the end-to-end solution
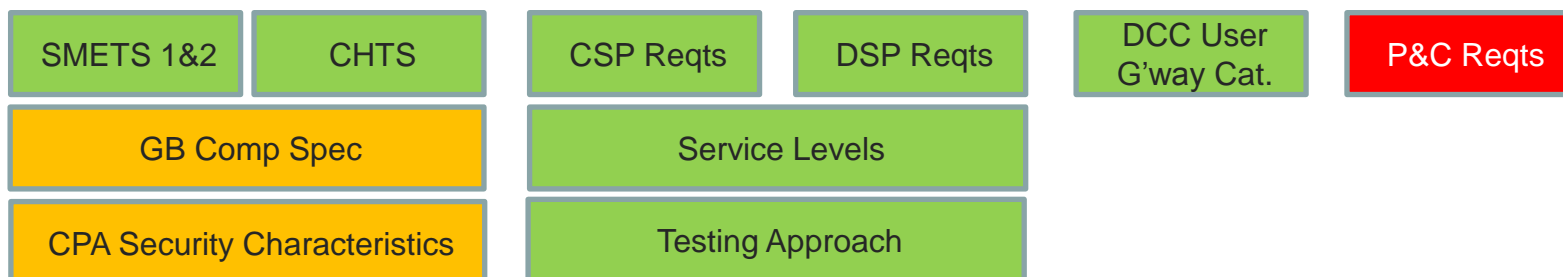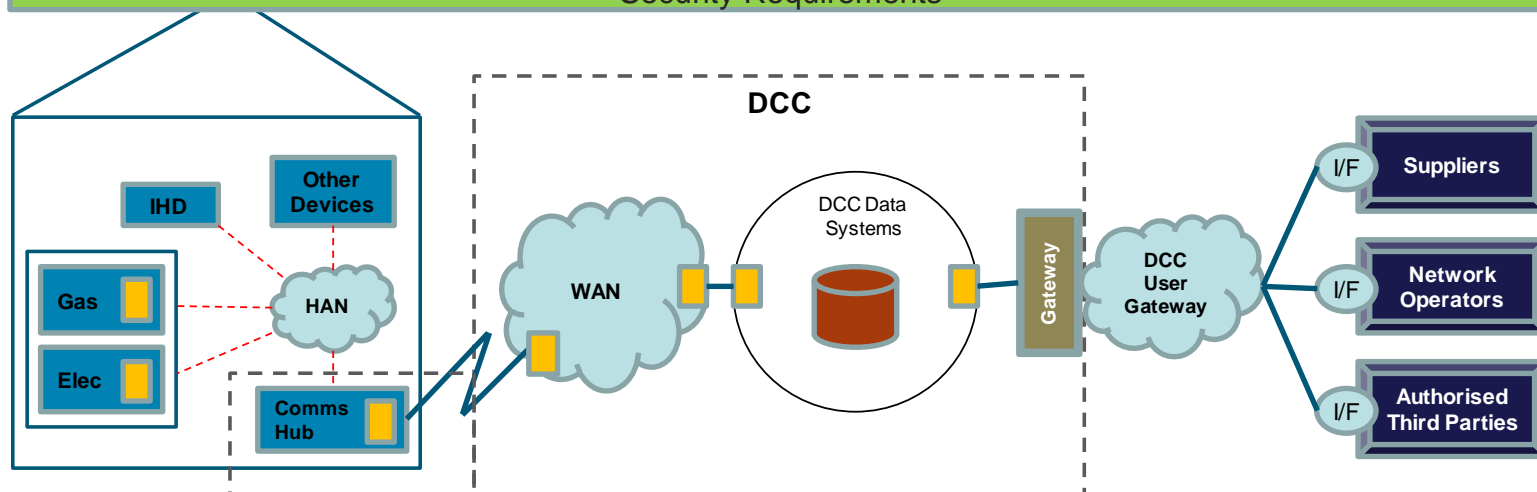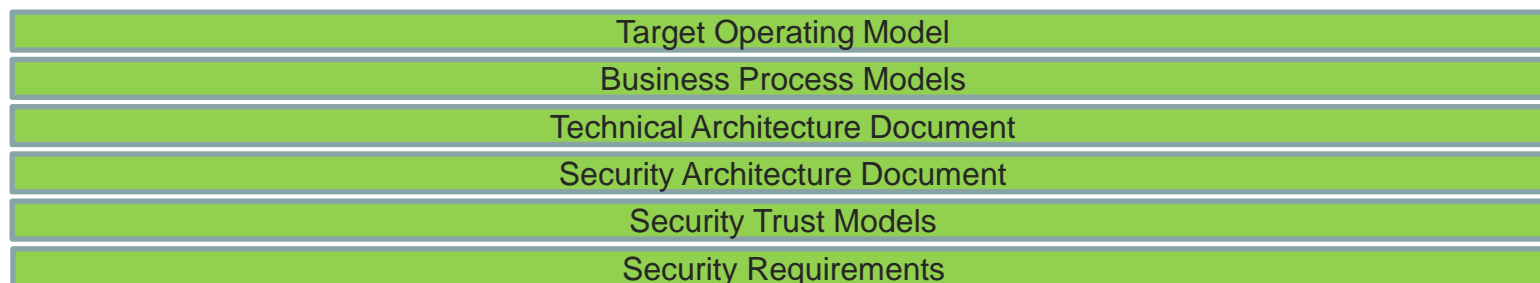
- Wired HAN mandate

BASELINED TECHNICAL ARCHITECTURE

Architecture Artefacts – Status as at CSP/DSP ISFT

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- Target Operating Model
- Business Process Models
- Technical Architecture Document
- Security Architecture Document
- Security Trust Models
- Security Requirements

Other Devices

IHD

Gas

Elec

HAN

Comms Hub

WAN

DCC

DCC Data Systems

Gateway

DCC User Gateway

I/F Suppliers

I/F Network Operators

I/F Authorised Third Parties

SMETS 1&2 · CHTS · CSP Reqts · DSP Reqts · DCC User G'way Cat. · P&C Reqts

GB Comp Spec · Service Levels

CPA Security Characteristics · Testing Approach
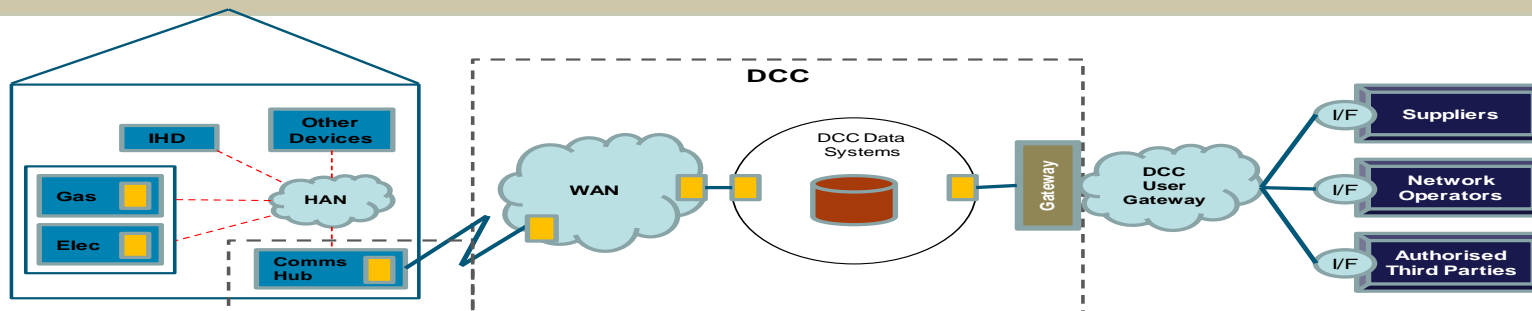
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Architecture Artefacts – Design Documents (selected examples)

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- GB Companion Specification
- CPA Security Scheme
- SMETS 2 (2)

- 868 Technical Reqt Specification
- Wired HAN Approach

- CH Detailed Spec
- ICHI Specification
- CH Installation Support Materials
- Asset Register
- Service Mgmt Strategy

- Solution Architecture
- Configuration Items Catalogue
- Component Specs
- Interface Specs
- Error Handling Strategy
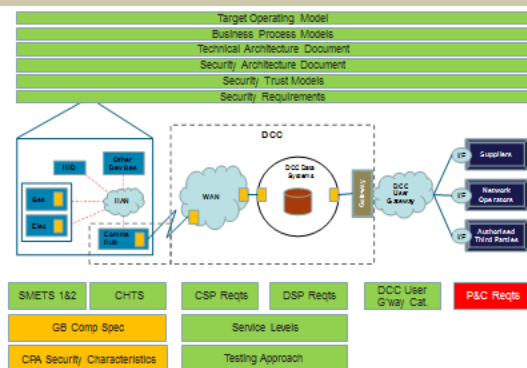- Availability Plan
- Capacity Plan

- SMWAN CoCo

- DUGC CoCo

Architecture Artefacts – Document Distribution

Architecture Artefacts – Status as at CSP/DSP ISFT

- 'Green' docs will be circulated to SDAG following release of ISFT

- Use Cases from GBCS – issued for comment

- CPA – being developed in workshop process

- P&C reqts – expect to issue for comment in May

- Updated product list circulated to SDAG on 18/4/13

- Products list to be completed following ISFT release

Group	Workstream	Schedule 6.3 Reference	Timing	Product Name	Content	Owner	Version Number
A- Arch	E2E			Target Operating Model	Textual description of how the Smart Meter Scheme will be operated, once fully implemented	DECC	2.0
A- Arch	E2E			Business Processes (E2E)	Business processes mapped as part of the process of developing the technical requirements prior to Licence and Contract Award. Developed in consultation with Industry through SDAG and other working groups	DECC	2.1
A- Arch	E2E			Technical Architecture (E2E)	Baseline iteration at Licence Award, which will focus on the 'Logical View' - elaboration of component specifications and architectural mechanisms from the conceptual view providing a product-independent reference solution describing systems and interconnections. An Application model, describes the end-to-end system in terms of key responsibilities supported by grouped logic and/or functionality. An Information model, describes at a high level the key data items, relationships, and where these data items reside with respect to the system components. A Technology model, describes the infrastructure required to support both the information and application models, i.e. the components onto which application functionality can be mapped, the interaction between those components, and the components upon which information will reside	DECC	0.4
A- Arch	E2E			Security Architecture (E2E)	Describe the security controls that will be used to secure smart metering and how those controls are applied to the technical components that make up the Smart Metering Implementation	DECC	2.07
A- Arch	E2E			Security Architecture 'Trust Models' (E2E)	The derived trust models define, against an abstracted and generic smart metering architecture, and for a particular process /activity, the relationships between entities where there are requirements for confidentiality, integrity and/or authenticity and the resultant assumptions and consequences for any system design.	DECC	0.9

3. PPMID – SUMMARY OF FINDINGS

Peter Morgan

PPMID

SDAG comments

193 Comments received – main themes:

- Clarification and scope of PPMID
  - What is the scope, when should it be provided, supplier responsibility etc.

- Power supply requirements
  - Remove battery / clarify battery life

- Overlap with IHD requirements
  - Remove items that are shown on the IHD but not the meter

- Enable supply for gas
  - Add / don't add gas enable functionality

- Other
  - Specify user interface
  - Add clock

4. REVIEW OF GBCS AND USE CASES

Peter Morgan

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All 3 documents very much WIP with a corresponding disclaimer

- GBCS Skeleton (26 pages)
    - Security – examples of keys, encryption, UTRN format etc
    - Transport requirements – examples of HAN ready message formats
    - Events – examples of Event management
    - Protocol references
- Annex: Gas Use Cases (222 pages)
- Annex: Protocol Conformance (69 pages)

GB Companion Specification

Next steps

Activity

- Comment review
  - DCC bidder comments
  - SDAG comments
- Update GBCS (security and HAN ready message sections will be rewritten)
- Plan for working more closely with successful bidders

Milestone

- First draft complete GBCS (in terms of use cases, security and HAN ready message section) must be provided DCC bidders end of July
- Protocol specifications will be updated post July

5. HAN CONNECTED AUXILIARY LOAD CONTROL (HCALC) UPDATE

Kevin House

Contents of this update

- Process to finalise the specification
- Solution overview update (current working draft)
  - HCALC DDS
  - SMETS changes – explain approach
  - GB Companion Specification
- Summary of responses following SDAG workshop

Process to finalise the specification

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ALC solution will be defined within 3 documents

1. HCALC Detailed Design Specification (DDS)
2. SMETS2 version B (rationalisation and minor enhancements)
3. GB Companion Specification

Review stages

- ~~Initial research and review - completed~~
- ~~SDAG workshop and responses - completed~~
- BEAMA review 'hold up' costs – w/c 15/4
- SSWG review detail of possible enhancements to assess significance of implied protocol changes – w/c 22/4
- Cost and time impacts assessed – w/c 3/5*
- Issue HCALC DDS for SDAG review – w/c 3/5*
- HCALC DDS 1.0 completed – late May
- Issue HCALC DDS to CESG for CPA preparation – late May
- GBCS and SMETS2 version B next draft issued - July

*target date, if no material issues raised in prior steps. May extend if amendments are required

HCALC override/boost solution – enhancement option being reviewed

HCALC optional variant

- Supplier has the option to block override during ad hoc events (possibly also during calendar events or always)
- An HCALC self-manages its own override
- Only 1 fixed rule – cannot override during a 'no override' period
- Other functionality can be designed by manufacturer (e.g. temperature-dependency, flexible durations etc.)

(Base) ESME

- Includes an 'override allowed' Boolean flag in HAN commands
- Receives HCALC override start/stop notification messages
  - records event in log
  - updates switch current state

HCALC detailed design specification (summary of current working draft)

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Base

Functional capability

8.4.1 Delay timer(s) [n]
- Independent timer element for each ALCS
- 1 to 1440 mins (=24h)

8.4.2.1 Power Supply loss
- open switches

8.4.2.1 Power Supply restoration
- open switches
- Use 8.5.3.1

HAN cmds received

8.5.2 Request ALCS [n] State Change
- If instructed to open
  - Open switch [n]
  - Send response of success (optional fail, if detectable)
- If instructed to close
  - Close switch [n]
  - Send response of success (optional fail, if detectable)
  - If duration supplied (normal)
    - wait for duration
    - Open switch [n]
    - Commands received for [n] in interval supersede

HAN cmds issued

8.5.3.1 Request ALC Refresh
(used on supply restore or any other event where state needs re-establishing)
- Repeat if no response

User interface cmds

No requirement for a user interface

Override

8.8.1 Override action
- Self-managing
- During override period, close ALCS
- Not allow override during a 'no override' period
- Use 8.9.2.1 to notify ESME of override start or finish

8.9.2.1 Notify ALCS Override State
(used whenever an override event starts or ends)

No specific requirements for a user interface, but it is anticipated manufacturers will develop their own options for override usage

Rationalisation of SMETS2, including support for HCALC detailed design (summary of current working draft)

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	Functional capability	HAN cmds received	HAN cmds issued	User interface cmds

Base

5.4.10.1 Switching ALs according to calendar
• Use 5.4.10.3 capability

5.4.10.2 Switching ALs on supply change events
• Use 5.4.10.3 capability

5.4.10.3 Set correct state for ALC [n]
• Calculate state from
  • Supply state
  • Ad hoc command in effect
  • ALCS calendar
  • Random offset
• Use 5.5.4.1 capability

5.5.3.18 Reset ALCS [n] State
• Identify which ALCSs, for each
• Use 5.4.10.3 capability

5.5.3.26 Set ALCS [n] State
• Identify which ALCSs, for each
• Use 5.4.10.3 capability
• Wait for specified duration, then
• Use 5.4.10.3 capability

5.5.3.32 Request ALC Refresh
• Identify which ALCSs, for each
• Use 5.4.10.3 capability

5.5.3.33 Notify ALCS Override State
• Record status in ESME

5.5.4.1 Request ALCS [n] state change
• (time specified for close only, override allowed status included)
• Record result in status
• If fail, record fail in event log and raise alert

ALC

5.17.1 Switching ALs
• As base, but can use internal switch instead of HAN command

5.17.1 Test ALs [n]
• Flip state for 5 mins
• Revert to calendar
• Record event

Boost

5.21.1 Switching ALs
• As base, but also consider boost status

5.21.2 Boost User Interface Commands
• Calculate/apply 15 min increments up to 60 min
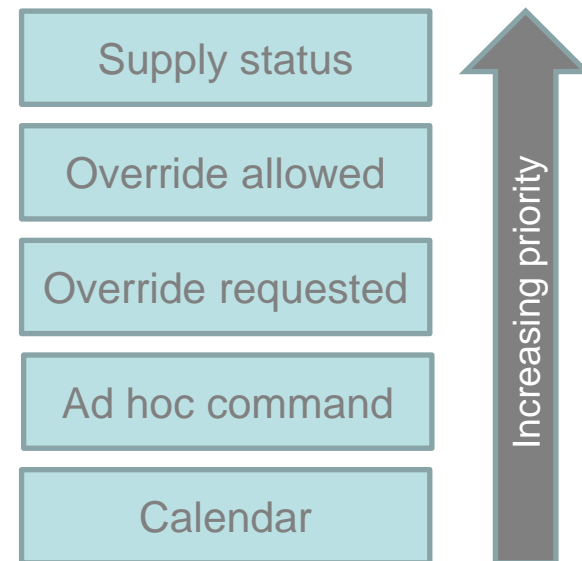• Use 5.4.10.3 capability

GB Companion specification contents in relation to ALC

In relation to ALCSs, GBCS will define

- Support for up to n devices and up to N switches
- Explicit format of WAN and HAN commands
  - Including the parameters and their interpretation (e.g. for 'all' options)
- 'State machines'
  the rules which determine when an ALCS should be open or closed, taking into account:
  - The five key inputs (see diagram)
  - Randomisation (incl. ad hoc commands' one-off randomisation)

(NB. Complementary state machines defined for ESME and HCALC)

Supply status

Override allowed

Override requested

Ad hoc command

Calendar

Increasing priority

Summary of SDAG responses and DECC current views

Responses related to 7 topics:

- **Requirement and solution for boost**
  - Both ESME- and HCALC-boost are desirable as options

- **Specific switch functional behaviours**
  - The 'fail open' model is suitable, with 'hold up' as an optional variant

- **Data elements and configuration**
  - Additional load types added, with SEC to govern future amendments
  - Data elements for ESME-ALC and HCALC will be consolidated

- **Security and manipulation**
  - HCALCs are type 1 devices, with CPA certification
  - Tampering does not benefit a consumer

Summary of SDAG responses and DECC current views

- Risks of complexity causing cost or delay
  - Protocol requirements are marginally more than in SMETS2 first version
  - Impacts of proposals are under review with SSWG and BEAMA
- Related industry processes and practices
  - DECC is pleased to see that Ofgem is actively investigating the coordination issue
  - SM load control elements are optional – Suppliers have choice and control over addition of ALCSs
- SMIP approach to ALCS design
  - Load control support is considered a 'base requirement'
  - The programme has explored a breadth of options over 2+ years (including hothouse and EMVWG) to reach the current working draft which is still under review

6. SERVICE LEVEL PERFORMANCE MANAGEMENT

Dominic Gibbeson

Measuring Service Response Times

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- The DSP and CSP contracts contain a number of Service Measures, where underperformance against these Service Measures results in Service Credits (i.e. lower operational charges to Service Users)

- One critical measure of performance is the time taken either to process Service Requests (DSP) or send Service Requests across the wide area network (CSP).

The purpose of this session is to:

1. Set out the end-to-end Service Measures

2. Explain what will be measured for CSPs and DSPs in order to meet these end-to-end Service Measures

Measuring Service Response Times

There are three high-level DCC end-to-end Service Measures

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- **PM1: On-Demand Service Responses / Service Acknowledgement**: measures the time between the Service Request being sent to the DSP and the Service Response being provided back to the Service User

  Target Response Time of 30 seconds plus HAN and meter processing time for 99%

- **PM2: Future Service Responses**: measures the time between when the Service Request is initiated and the time at which the Service Response is provided to the Service User. The time the Service Request is initiated is broadly defined as follows:

  - **Future Dated Service Request:** the future date and time of command execution associated with the Service Request

  - **Scheduled Service Response**: the future date and time at which the Service Response is scheduled

  Target Response Time of 24 hours for 99%

- **PM3: Alert Responses**: measures the time between when the Service Request is initiated and the time at which the Service Response is provided to the Service User. The time the Service Request is initiated is broadly defined as follows:

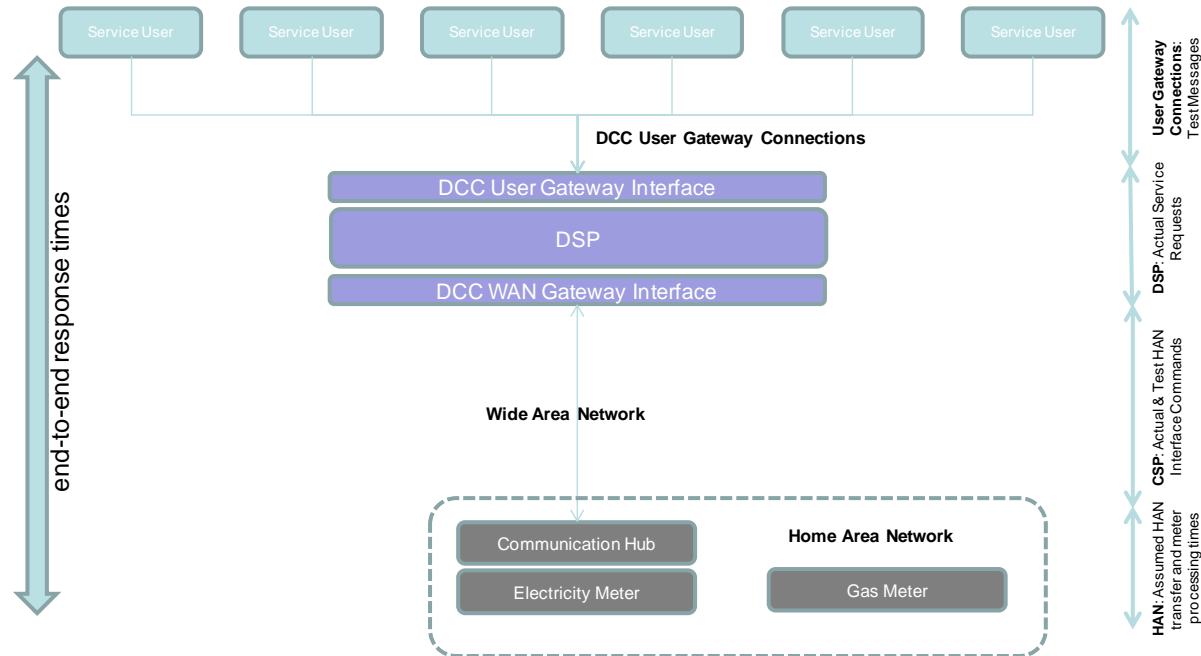 *Target Response Time of 60 seconds for 99%*

Whilst performance will be reported on at this high-level, DSP will track performance of individual types of Service Requests

Measuring Service Response Times

Overview of DSP / CSP measurement approach

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- **DSP Measures:** individual Service Requests and Service Response passing between DCC User Gateway Interface and DCC WAN Gateway Interface

- **CSP Measures:** individual messages for Firmware and Meter Scheduled Service Requests, and test messages for all other messages

NOTE: HAN and meter processing time is excluded from all DSP / CSP measures

Measuring Service Response Times
DSP / CSP measures combine to meet end-to-end performance

Service Request / Alert	Service Response	E-2-E: Target Response Time	DSP Performance Measure	CSP Performance Measure
On-Demand	On-Demand Service Response	30 seconds + Agreed HAN transfer and meter processing time	SM1.1 (4 seconds) SM1.6 (1 second)	SM4.1 (25 seconds)
Future Dated	Service Acknowledgement	24 hours	SM1.1 (21 hours)	SM4.3 (2 hours)
	Future Service Response	24 hours	SM1.2 (30 minutes)	SM4.3 (22 hours)
Firmware Delivery	On-Demand Service Response	5 days	SM1.2 (22 hours)	SM2.1 (4 days)
DCC-only	On-Demand Service Response	30 seconds 24 hours	SM1.4 (29 seconds / 24 hours) SM1.6 (1 seconds)	n/a
Scheduled	DSP-Scheduled: Future Service Response	24 hours	SM1.2 (30 minutes) SM1.3 (21 hours)	SM4.2 (2 hours)
	Meter Scheduled: Future Service Response	24 hours	SM1.2 (30 minutes)	SM3.1 (22 hours)
Alerts	Alert Response	60 seconds	SM1.5 (4 seconds) SM1.6 (1 second)	SM3.2 (55 seconds)

- The DSP and CSP contracts split Service Requests into 6 basic types, each of which has a number of measures

- The targets on each of these measures have been set to meet the end-to-end response times.

7. INTIMATE COMMUNICATIONS HUB INTERFACE UPDATE

Seamus og Gallagher

Developing the ICHI specification

- DCC will be required in the SEC and its contract to develop a single ICHI specification through the CSPs.

- The ICHI specification will describe both the male and female (meter and hot shoe) components of the interface such that compliant equipment will interconnect in a robust and reliable manner.

- DCC will be required to follow a process to develop the ICHI specification, including ensuring that CSPs undertake:

  - Consultation with suppliers and other industry parties;

  - Analysis of the costs of the solution and comparison of alternatives considered during its development;

  - Prototype development and testing.

- DECC will sign-off that this process has been followed before the specification can be finalised.

- DCC will maintain the ICHI specification.

CSP requirements

- Bidders to be asked to provide detailed costings based on the BEAMA document.

- CSPs required to consider the BEAMA requirements when developing ICHI specification – DCC will apply change control to bids as necessary when the ICHI specification is finalised.

- CSPs contract will set the scope of the ICHI specification:
  - The specification is for the physical, electrical and data interface;
  - The specification is for the "male" and "female" aspects of the interface;
  - The specification should describe termination arrangements for male and female connectors both for when they are used and unused;

- The following high-level requirements must also be described in the specification

High-level requirements (1)

General Interface Requirements

- The interface shall be based on open standards
- The interface shall allow for ease of installation including situations where the interface is not visible to an installer

Physical Interface Requirements

- The interface shall have a common form factor for its connector
- The interface shall have a common form factor for its mating surfaces
- The interface shall have shall have a consistent mating force for manual installation without the need for any tools
- The interface shall have an anti-tamper mechanism and a security seal
- The interface shall have a locking mechanism to attach to the Communications Hub

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Electrical Interface Requirements

- The interface shall provide a separate DC power connector
- The interface shall include an identified, separate AC power connector
- The interface shall include protection for the attached devices

Data Interface Requirements

- The interface shall include identified data connectors for:
    - HAN PLC
    - WAN PLC
    - communications hub to ESME communication

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DCC (delivering through CSPs)

- Required to procure equipment that complies with the CHTS.
- CHTS requires that the CH includes an Intimate Physical Interface (i.e. all CH are intimate), which is defined as:

    A standardised interface defined by the DCC.

- CHTS also requires that:

    A CH shall operate using DC power […].

Energy suppliers

- Required to install equipment that complies with the SMETS.
- SMETS 2 will require that:

    The GSME/ESME shall include a Communications Hub interface, including a DC power supply, as described by the DCC.

8. AOB

AOB

- Workshops

  - Install and Commission, and CoS – 15 May 13

  - Service Management – 22 May 13

  - Firmware Management – 29 May 13

- Offer of 1:1 meetings remains open

- NPower - Decisions timeline EED 24 months requirement

ENERGY EFFICIENCY DIRECTIVE UPDATE

Seamus og Gallagher

Energy Efficiency Directive Update

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- Proposals to provide domestic consumers with easy access to at least 24 months of consumption data free of charge.

- We asked:
  - Whether the capability for daily reads should be added to SMETS 2 meters;
  - How suppliers should provide consumers with access to this data.

- Consultation closed on 6 February.

- In response:
  - Most agreed that SMETS 2 should include daily read requirements;
  - General preference for less prescription in how suppliers provide access to data.

- Current position (subject to confirmation):
  - Retain requirements added to SMETS 2;
  - Require suppliers to provide consumers with access to their data either over the internet or via the meter interface;
  - Requirements will apply to SMETS 1 meters.

Next Meeting

- Meeting #7 – 28 May 2013

    BIS Conference Centre, 10am–3pm,