Document:

Reference Architecture

Part:

Collaboration Reference Architecture

Dated:

April 2022

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# Collaboration Reference Architecture

Reference:

## Introduction

As the use of technology drives shorter decision cycles, the need for larger and wider groups of people to collaborate increases. This has now reached the point that collaboration must not only occur more broadly within an organisation, but now also across organisational boundaries. As these organisations are typically geographically separate, technology is used to facilitate collaboration. When organisations wish to collaborate, decisions need to be made about where the collaboration occurs.

1. In Defence’s case the picture is more complex than other departments or indeed most businesses, as Defence cannot just treat its ICT environment as a single central service point. The constrained and sometimes contested communications environment it must work with in the deployed space forces it to operate as a multitude (potentially hundreds) of individual and autonomous organisations. This results in Defence’s enterprise resembling more the Internet rather than a typical corporate environment. Additionally, collaboration with a range of external partners needs to occur from various locations across the enterprise.
2. This Reference Architecture will cover the terms and models used to describe the various aspects of collaboration.

### Definition

For this document, collaboration is defined as interaction between two or more geographically separate humans principally using specific ICT technology and/or tools to achieve a business outcome. The ICT technology and/or tools used are termed as the ‘Collaboration Type’ in this document. Collaboration type is determined by collaboration forms, time dimension of collaboration, direction, and modality. It is worth noting that this is vastly different from the meaning of English word collaboration, which also incorporates interaction between non-human entities. The English meaning includes collaboration that does not necessarily relate to business outcomes – a scenario not part of the definition here.

### Scope

This reference architecture applies to all enterprises.

### Audience

This document is for solution architects and capability planners. It is intended to guide and constrain technical solutions to fit within the overall enterprise. Planners involved in the capability planning function should apply the language and concepts introduced to ensure a consistent approach.

## Discussion

Collaboration is a form of Information Exchange between humans that enables several of the Fusion and Coordination activities. It exists in two forms:

1. **Meeting.** The nature of the collaboration is to allow everyone contribute to and maintain a shared level of understanding. It is a substitute for a physical meeting.
2. **Document.** Everyone can contribute to an actual product’s compilation as in multiple people working to make a word document. This type of collaboration is the electronic replacement of physically passing the document around for comment/note.
3. It also exists with two-time dimensions:
4. **Synchronous.** Everyone interacts in **real time**, as in online meetings, through instant messaging, or via Skype, and
5. **Asynchronous.** Where the interaction *can* be **time-shifted**, as when uploading documents or annotations to shared workspaces, making contributions to a wiki.
6. The nature of the collaboration can be further broken down by:
7. The direction of the information flow: **simplex** left to right (outward), simplex right to left (inward) or **duplex**.
8. The modality of the collaboration: It could be 1:1, 1: N or N: N, where:

**1:1** is just between two individuals. Examples would be a normal telephone call, a single chat session.

**1: N** is between one person and multiple others, where the others **cannot** communicate with each other. Examples would be a broadcast message over radio or a web page.

**N: N** is between multiple people. Examples would be group and/or persistent chat or a voice/video conference.

From Reference A, there are four Interaction *Modes* that can be applied generically to collaboration. They are shown in Figure 1. For each row, where individuals are trying to collaborate the service can be provisioned inside Defence, at an intermediary (i.e., cloud service provider) or at the 3rd party partner (not a member of the public). For collaboration, users are not typically aware of the topology; however, they would be aware of the *Interaction Location* if the collaboration is a room-based chat or document-based collaboration.

C0, C1, C2 and C4 pertain to collaboration[[1]](#footnote-2), in the sense that the boxes represent a ‘location’ that a user ‘goes to’ to collaborate. For the preceding examples, a host and room for chat, or, for documents, a particular website/folder. C0 is the case where the user does not ‘go’ anywhere to collaborate they communicate peer to peer, as in a telephone call.

Figure 1: Collaboration service models. The heavy vertical lines represent ‘organisational’ boundaries. Typically, the intermediary would be a cloud service provider on the internet.

## Collaboration types

As collaboration is defined as being for human-to-human interactions, the result must; therefore, rely on human sensors, and specifically sight and sound to typically interact with a computer. With sight we can see images and read.

1. For *meeting* collaboration where the intent is to be a surrogate meeting we have the following types:
2. Phone calls, Video calls, Chat, Whiteboarding, Presentation sharing,
3. The following are the types of technologies that are considered part of the collaboration landscape:

Email, SharePoint, Voice mail, SharePoint, Video cast, Video broadcast, White boarding, Screen sharing, Individual calendar, Group calendar, Newsgroups, Content sharing platform, Audio conference, and Video conference.

More about collaboration types and their appropriate choice is discussed as part of Decision Framework section of this document.

## 

## Collaboration scenarios

Improving employee engagement: This is a basic scenario for collaboration and is also a critical tenet for collaboration to make it useful when driven by business outcome.

1. Sharing of knowledge: Collaboration is required to share expertise and competencies across Defence. This may involve sharing of best practices, sharing expertise in functional areas, or pooling knowledge to better address business challenges. Actual expertise is rarely documented - books and manuals usually deal with principles of conducting business processes, and even detailed case studies are no substitute for sharing hands-on knowledge during live business processes.
2. Finding SMEs (Subject Matter Experts): This is closely related to knowledge dissemination. Knowledge dissemination process also identifies the SMEs for different knowledge areas. After identification SMEs can be used to drive solution for business challenges.
3. Sharing of tangible resources: Optimization of business activities, leveraging the benefits of scale and eliminating duplicated effort are areas where the sharing of physical assets and resources within an organization may be required - and this cannot be done without collaboration. This is also one of the biggest rationales of mergers and acquisitions. For example, an expensive hardware resource usage can be managed using a group calendar.
4. Team status sharing: When working in geographically disparate teams, collaboration tools are required to sharing team status, milestones, and solution demonstrations.
5. Co-ordinating business strategies: Providing rationale to mergers and de-mergers of divisions within Defence and forming partnerships with Defence of other countries is another critical area that requires collaboration. This is about the benefits of aligning the business strategies of two or more entities, by making coordinated reactions to common threats.
6. Co-ordinating flow of services: Collaboration is beneficial wherever there is need for vertical integration or need to coordinate the flow of services. Derived benefits range from lowering of inventory costs to enhancing capacity, shared product development, better capacity utilization, and better market access.

## Principles

The following principles are introduced to support this reference architecture:

1. Defence operates as a *private Internet*: Operations of Defence spans across Australia and internationally. As such, it has the need for extensive security within a large infrastructure to operate seamlessly without being pried upon. It is therefore akin to provisioning of large secure infrastructure like a private Internet.
2. Resilience and security are paramount: Critical Defence activities require the underlying systems to have extremely high availability (up to 99.999% depending on the activity / system). These collaboration tools would need to adhere to the high availability requirements of Defence. Further, all collaboration tools need to be secure to keep the threat profile within control.
3. Focus must be to achieve business objective: Collaboration is not a business end. It is a means to an end. And that end is better business results. Collaboration should focus on where it can have the biggest impact on achieving business results. These are typically those parts of the business where there is lots of dynamic information, where decisions are complex and where those decisions have far-reaching consequences. Collaboration should not be shoehorned into every discussion, dialogue, and decision if it is not warranted to get the desired results.
4. Treat collaboration like a capability: Collaboration is a capability. That means it is a complementary combination of people, processes, data, and context. Only when the right combination of these components is brought together does it create the ability to collaborate. As each of the components are increased, need to increase each of the others accordingly is required if collaboration is to increase. A little extra collaboration can be used to improve business results in many ways.
5. Align authority, information & decision making: Collaborating does not mean that everyone gets to decide. It means that the authority to make critical decisions is aligned with the information required to make them. That means the right information must be made available to the right decision maker at the right time. This can be a challenge where individuals routinely hoard information and where information is power.
6. Treat individual benefit to be just as important as organisational benefit: This would encourage employees to engage in collaboration and would help break silos and derive maximum benefit eventually.

## Benefits

The following benefits can be expected from appropriate use of collaboration:

1. Process improvement & excellence: Process impediments will be identified and removed quickly by sharing best practices within Defence.
2. Break down silos: Knowledge and best practices sharing across teams and divisions will help derive cooperation across them resulting in breaking down of silos.
3. Culture of sharing: Continuous collaboration will make sharing a habit and would foster culture of sharing.
4. Creativity & innovation across organisation: Culture of sharing will lead to innovative solutions, as best solutions will come to the fore through collaboration between SMEs and the users.

**Reference Models**

## Decision Framework

1. 

## Patterns

Each entry within the table described in the Decision Framework section of this document is a pattern that is relevant for collaboration. One example is shown below:

1. [↑](#footnote-ref-2)