1  Purpose and Scope
The purpose of Problem Management is to minimize the number of incidents and their severity by ensuring they can be resolved in an expedient manner. It aims to reduce the adverse impact of incidents caused by underlying errors in IT infrastructure and prevent their reoccurrence. This is accomplished by seeking to understand the underlying cause of an incident and addressing that cause.

The scope of this document is to describe the activities required to reactively address a Problem that results from a Major IT Service Issue by identifying, logging, diagnosing, and resolving problems for supported Division of IT services.
While proactive Problem Management is not presently in scope of this document, Service Owners and Service Providers may analyze incidents associated with their services and, if a Problem is identified, create and manage a Problem record.

2 Process Goals
- Prevent incidents from reoccurring by identifying and addressing their root cause
- Identify and manage sets of incidents related to a Major IT Service Issue
- Minimize the impact of incidents by documenting and communicating workarounds
- Complement the documentation goals of the Major IT Service Issue process

3 Document Owner
The document owner is responsible for ensuring that this document is accurate and up-to-date, following agreed processes.

This document is owned by the Deputy Executive Director within IT Experience & Engagement.

4 Definitions
- **Incident**: An incident is a disruption in use of an IT service. It can be more specifically considered a breach or potential breach of service level agreement. For services which do not have service level agreements, an incident is when an IT Service is not functioning within expectations or cannot be used. Incidents are typically reported by users, although incidents can also be identified through monitoring tools or IT employees.
- **IT status**: A notification section on the Service Portal (4help.vt.edu) that indicates any outages or degradations of IT services.
- **Known error**: A Problem with a documented root cause and workaround.
- **Outage**: A record created in the event of an Outage or Degradation of a core IT service.
- **Problem**: A cause of one or more incidents. The cause is not usually known at the time a Problem record is created.
- **Root cause**: An incident’s root cause is the fault in the service component that made the incident occur.
- **Workaround**: A temporary solution to reduce or eliminate the impact of incident symptoms. A workaround can temporarily restore service for a customer even though root cause is not fixed.

5 Roles and responsibilities
5.1 Problem Process Owner
Ensures process documentation is relevant and coordinates updates and communications of the process.
- Maintaining this process documentation.
- Communicating this process across the Division of IT.
- Supporting the Problem Process Manager in the operations of this process.
5.2 Problem Process Manager
Accountable for the operations of the Problem Management process across the Division of IT.

- Serving as an escalation point regarding any Problem Management Process issues or conducting activities that are part of the process.
- Relaying needs for process documentation updates to the Problem Process Owner.
- Coordinating parties involved in handling Problems.
- Reviewing Problem records in an Open state monthly and notifying Service Owners of when a Problem has been Open for more than a month with no action.

5.3 Incident Coordinator
The Incident Coordinator assumes responsibility during a major IT service issue.

- Creating an initial Problem record and assigning it to the group whose service triggered a Major IT Service Issue.
- Creating an Outage record from the Problem record.
- Linking incidents to an established Problem and setting the incident(s) state to “Awaiting Problem”.

5.4 Information Center
Virginia Tech’s 24/7/365 Information Center serves as a point of contact for end users within the University and outside of the University and is responsible for the following activities:

- Checking indicators on incidents of active outage and a related Problem.
- Linking incidents to an established Problem and setting the incident(s) state to “Awaiting Problem”.

5.5 Service Desk
The Service Desk is a function of 4Help and responsible for the following activities:

- Checking indicators on incidents of an active Outage and a related Problem.
- Linking incidents to an established Problem and setting the incident(s) state to “Awaiting Problem”.

5.6 Service Provider
- Checking indicators on incidents of active outage and a related Problem.
- Linking incidents to an established Problem and setting the incident(s) state to “Awaiting Problem”.
- Identifying Technical Experts to assist with investigating and diagnosing problems.
- Documenting technical events or information about the Major IT Service Issue in the Problem process.
- Identifying and testing workarounds to mitigate symptoms of Problem.
- Documenting workarounds in a Problem.
- Communicating workarounds to Problems when the workaround should be sent to users being impacted.
• Marking a Problem as Known Error when root cause is identified and there is a workaround posted to the Problem.
• Resolving incidents in state of ‘Awaiting Problem’ that are associated with Problem

5.7 Service Owner
• Linking incidents to an established Problem and setting the incident(s) state to “Awaiting Problem”
• Attaching (or having a designee attach) the after-action review of the Major IT Service Issue to the Problem.
• Closing/resolving a Problem when action has been taken on root cause.
• Overseeing the Problem process with the Service Provider

6 Process

6.1 Major IT Service Issue with Problem process

<table>
<thead>
<tr>
<th>Triggers</th>
<th>• Major IT Service Issue</th>
</tr>
</thead>
</table>
| Inputs   | • Description of the interruption or issue  
|          | • Identification of the service experiencing the issue  
|          | • Symptom information from incidents  
|          | • Configuration details from the configuration management database |
| Outputs  | • Problem record description of Problem and affected service  
|          | • Documentation of technical information related to the Problem  
|          | • Communications to submitters of incidents  
|          | • Documented workaround  
|          | • Known error (in some cases)  
|          | • Set of affected incidents from the Problem  
|          | • Closed problem records for resolved problems  
|          | • After-action review attached to Problem record |

1. The Incident Coordinator creates a new Problem record and assigns it to the appropriate group based on the service (Configuration Item) being affected.
2. The Incident Coordinator creates an Outage record (used for IT Status) from the Problem record. This record is used for IT Status updates as per the Major IT Service Issue process.
3. The Service Provider assigns the Problem to an individual in their group.
4. The Service Provider notifies the Service Owner of the Problem.
5. The Incident Coordinator, Information Center, Service Desk, Service Provider, and Service Owner link incidents to the Problem and set the state of each linked incident to “Awaiting Problem”. When a Configuration Item has an active outage, an indicator will show next to the Configuration Item field, which also indicates there is a Problem record to which the incident may be linked.

6. The Service Provider (primarily) and Service Owner post work notes to the Problem record, keeping track of technical events, updates, and progress identifying a workaround and potential causes of the Problem.

7. Once a mitigation for the symptoms resulting from a Problem are discovered, the Service Provider and Service Owner test their workaround and, if successful, post that workaround to the Problem record.

8. The Service Provider and Service Owner may communicate the workaround to incident submitters. Communicating the workaround posts the text for the most recently posted Workaround as Additional comments to all associated incidents.

9. The Service Provider and Service Owner may flag a Problem as Known Error if the root cause of the Problem is documented and there is a successful workaround to the Problem.

10. The Service Provider and Service Owner conduct an after-action review (refer to the Major IT Service Issue process) to identify and address the root cause of the Problem. This after-action review is then attached to the Problem (most commonly as a PDF).

11. The Service Provider and Service Owner resolve all incidents associated with the Problem record that are in the “Awaiting Problem” state.

12. If the Service Owner deems that action has been taken on the root cause of the Problem to prevent the occurrence of future incidents, then the Service Owner will document the steps taken to address the root cause in the Close Notes of the Problem record and set the Problem state to “Closed/Resolved.”
7 Workflow of Process

The following diagram is an overview of steps.

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8 Related documentation

The below processes, policies, or other documentation are related to this process:

<table>
<thead>
<tr>
<th>Process</th>
<th>Process Owner</th>
<th>Relationship to this process</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major IT Service Issue</td>
<td>Deputy Executive Director, ITE²</td>
<td>Triggers this process and supplies after-action report referenced in this process.</td>
<td>it.vt.edu/process</td>
</tr>
<tr>
<td>Problem Usage Reference Sheet</td>
<td>Deputy Executive Director, ITE²</td>
<td>Provides details and screenshots for carrying out some activities which are described at a high level here.</td>
<td>it.vt.edu/process</td>
</tr>
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9 Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Author(s)</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version 1-2</td>
<td>David Duckett</td>
<td>July 6, 2018</td>
<td>Minor addition that Close Notes field on Problem record should document steps taken to resolve root cause of Problem.</td>
</tr>
<tr>
<td>Version 1-1</td>
<td>David Duckett, Carol Hurley, Lucas Sullivan, Joyce Landreth</td>
<td>May 16, 2018</td>
<td>Establish a process for the Division of IT to benefit from and become familiar with the reactive Problem Management.</td>
</tr>
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</table>

10 Identified Process Improvements to Implement
The below are improvements identified for consideration during future revisions of this document:

- Document the proactive component of Problem Management. This would include other means of Problem detection:
  - Service Provider/Service Owner/Problem Process Manager observes frequent or recurring incidents that suggest an underlying issue.
  - Service Provider/Service Owner Problem Coordinator is notified by vendor that a problem exists.
  - Service Provider/Service Owner sees a trend in incidents that suggests an underlying issue.
- Consider formation of a Problem Review Board across the Division to help perform root cause analysis and more effectively identify workarounds/advance problems to a state of resolution.
- Use of Impact and Urgency fields for Priority calculations.
- Create Change Management process and connect with this process for implementing changes intended to resolve root cause.