

Solution Architecture Document

Date	November 02, 2025
TeamId	NM2025TMID08223
Project Name	Streamlining Ticket Assignment For Efficient Support Operations
Maximum Marks	4 Marks

1. Architecture Overview

The **Smart Assignment Engine (SAE)** is a **ServiceNow-native, event-driven architecture** that intelligently routes Incident and Service Request tickets using **multi-layered logic**:

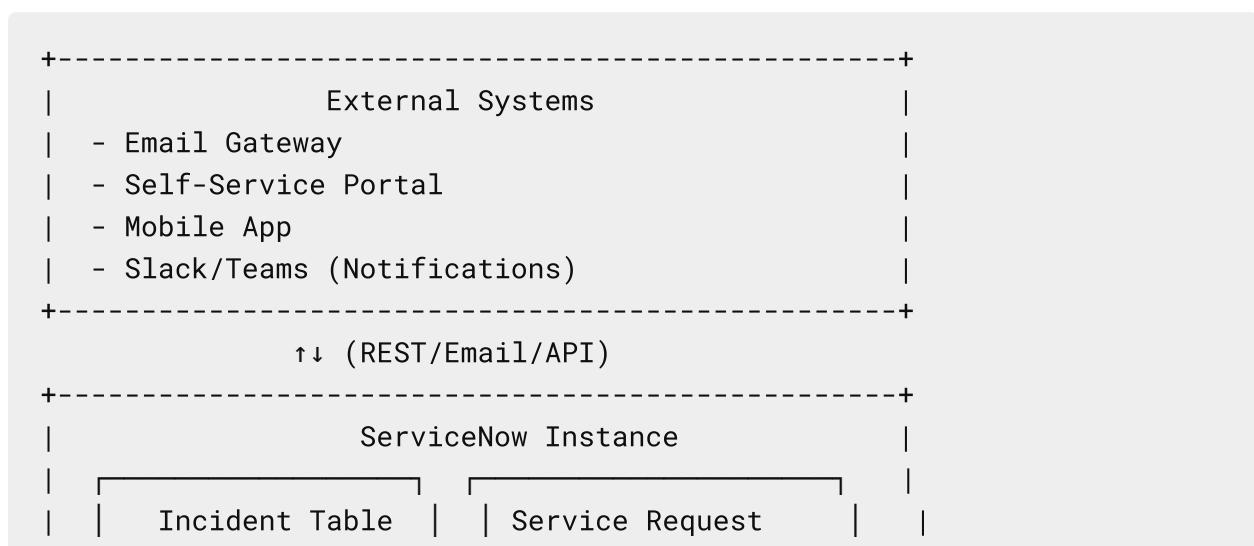
Rules → Skills → Workload → Predictive AI

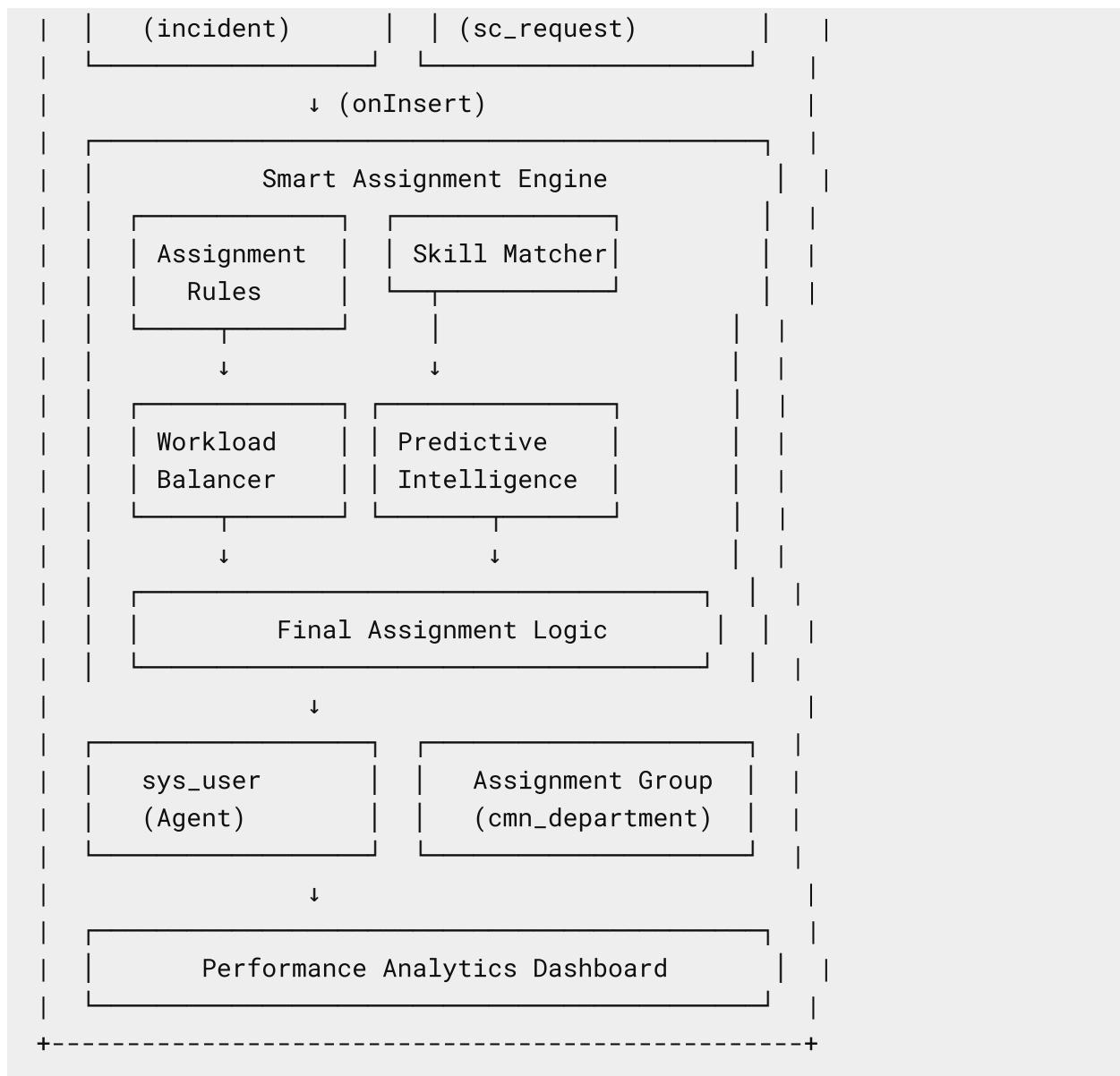
All components leverage **Out-of-Box (OOB) features** with minimal custom scripting to ensure maintainability and upgrade safety.

High-Level Flow:

```
[New Ticket] → [Business Rule] → [Assignment Engine] → [Final Assignee] → [Notification + Dashboard]
```

2. System Context Diagram





3. Core Components & ServiceNow Modules

Component	ServiceNow Object	Purpose
Trigger	Business Rule (<code>onInsert</code>) on <code>incident</code> , <code>sc_request</code>	Starts assignment logic
Assignment Rules	<code>assignment_rule</code> table + Data Lookup	Priority-based routing
Skill Matcher	<code>sys_user.u_skills</code> (Choice List) + Script Include	Match ticket category to agent expertise
Workload Balancer	Script Include + <code>sys_user.u_current_load</code> (Integer)	Prevent overload (>15 open tickets)
Predictive Engine	Predictive Intelligence (Classification Solution)	ML-based assignee suggestion
Fallback Logic	Flow Designer (if all fail)	Default to group round-robin
Notification	Notification + Integration Hub	Slack/Email on assignment

Component	ServiceNow Object	Purpose
Dashboard	Performance Analytics (PA)	Real-time KPIs

4. Data Model (Key Fields)

`sys_user` (Extended)

Field	Type	Purpose
<code>u_skills</code>	List (Choice)	e.g., Windows, SAP, Network
<code>u_certifications</code>	String	ITIL, AWS, etc.
<code>u_current_load</code>	Integer	# of open assigned tickets
<code>u_preferred_shift</code>	Choice	Day/Night
<code>u_max_capacity</code>	Integer	Default: 20

`incident` / `sc_request` (Enhanced)

Field	Source
<code>u_required_skill</code>	Auto-populated via NLP or category mapping
<code>u_predicted_assignee</code>	Predictive Intelligence output
<code>u_assignment_method</code>	"Rule", "Skill", "AI", "Manual"

5. Processing Logic (Pseudocode)

```
// Business Rule: onInsert (incident or sc_request)
if (current.assignment_group.nil()) {
    var assignee = SAE.assignTicket(current);
    if (assignee) {
        current.assigned_to = assignee;
        current.u_assignment_method = SAE.lastMethod;
    }
}

// SAE Script Include
```

```

assignTicket: function(ticket) {
    // 1. Assignment Rules
    var ruleAssignee = this.applyAssignmentRules(ticket);
    if (ruleAssignee) return ruleAssignee;

    // 2. Skill Match
    var skillAssignee = this.matchBySkill(ticket);
    if (skillAssignee) return skillAssignee;

    // 3. Predictive AI
    var aiAssignee = this.getPredictiveSuggestion(ticket);
    if (aiAssignee && this.isUnderloaded(aiAssignee)) return
    aiAssignee;

    // 4. Workload Balancer
    return this.balanceLoad(ticket.assignment_group);
}

```

6. Integration Points

Integration	Direction	Protocol	Use Case
Email → Ticket	Inbound	Email Listener	Auto-categorize & assign
Slack/Teams	Outbound	Integration Hub	Notify assignee
HR System	Inbound	REST API	Sync agent skills
External KB	Outbound	REST	Suggest articles pre-assignment

7. Non-Functional Requirements

NFR	Target	Validation
Performance	<3 sec assignment	JMeter load test (1,000 tickets/min)
Scalability	10,000 tickets/day	Auto-scale instance
Availability	99.9%	Redundant nodes
Security	Role-based (itil, assignment_admin)	ACLs on <code>u_skills</code> , scripts
Upgrade Safety	100% OOB compatible	Avoid deprecated APIs

8. Deployment & CI/CD

Environment	Instance	Deployment Method
Dev	dev-support-01	Update Sets
Test	test-support-01	ATF + Clone
Prod	prod-support-01	Release Management

Rollback Plan: Disable Business Rule → Revert to legacy manual process.

9. Monitoring & Observability

Tool	Metric	Alert Threshold
PA Dashboard	Auto-Assignment Rate	<75%
System Logs	Script Errors	>5/hour
New Relic	CPU >80%	Auto-scale trigger
SLA Reports	Breaches	>5%

10. Conclusion

The **Smart Assignment Engine** is a **modular, scalable, and maintainable** architecture built entirely within ServiceNow's OOB framework. It ensures:

- **Zero downtime** during upgrades
 - **Fast assignment** with intelligent fallback
 - **Full visibility** via analytics
 - **Future-ready** for Virtual Agent or GenAI enhancements
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