

BridgeControl User Stories

Implementation Milestones

Milestone 1 - Foundation

#	Story	Priority	User Story
1	User Authenticates and Maintains a Secure Session	Must Have	As User, I want to authenticate and maintain a secure BridgeControl session, so that I can use protected functionality while invalid, expired, logged-out, or disabled sessions are rejected.
2	User Manages Account Password, Recovery and Activation	Should Have	As User, I want to change my password, recover access, and activate my account securely, so that I can maintain access without an administrator knowing my permanent credentials.
3	BridgeControl Administrator Manages Software Vendors	Must Have	As BridgeControl Administrator, I want to create, view, edit, deactivate, and reactivate Software Vendors, so that the platform can manage Vendor tenants throughout their lifecycle.
4	BridgeControl Administrator Establishes Initial Vendor Administration	Must Have	As BridgeControl Administrator, I want to create the initial Vendor Administrator for a Software Vendor, so that the Vendor can take over administration of its own organization.
5	BridgeControl Provisions an Isolated Database for Each Vendor	Must Have	As BridgeControl, I want to provision a separate Vendor database when a Software Vendor is created, so that each Vendor's operational data is physically isolated from other Vendors.
6	BridgeControl Resolves the Correct Vendor Database for Each Request	Must Have	As BridgeControl, I want to resolve the authenticated user's or Agent's Software Vendor before opening operational data, so that every operation is executed against the correct isolated Vendor database.
7	Vendor Operational Data Is Stored Only in the Vendor's Isolated Database	Must Have	As BridgeControl, I want to store Customer, Product, Installation, configuration, migration, deployment, log, and audit data only in the owning Vendor database, so that operational data cannot be mixed between Software Vendors.
8	Administrator Creates Roles and Assigns Delegated Permissions	Must Have	As Administrator, I want to create custom roles and assign permissions within my administrative scope, so that responsibilities can be delegated without expanding organizational scope.
9	Administrator Assigns and Maintains User Roles Within Scope	Must Have	As Administrator, I want to assign, change, and remove roles for users within my scope, so that delegated access stays aligned with current responsibilities.
10	Administrators Receive Full Permissions Within Their Scope	Must Have	As Administrator, I want to have all permissions available inside my administrative scope, so that I can fully administer the resources I am responsible for.
11	Backend Enforces Permissions and Delegation Limits	Must Have	As BridgeControl, I want to enforce permissions and delegation limits server-side, so that UI manipulation or direct API calls cannot bypass authorization.
12	Vendor Administrator Manages Vendor Administrators	Must Have	As Vendor Administrator, I want to create, view, edit, and deactivate other Vendor Administrators, so that Vendor administration can be maintained without losing the final active administrator.
13	Vendor Administrator Manages Vendor Technicians	Must Have	As Vendor Administrator, I want to create, view, edit, and deactivate Vendor Technicians, so that technician access can be administered centrally.
14	Vendor Administrator Manages Customers	Must Have	As Vendor Administrator, I want to create, view, edit, and deactivate Customers, so that the Vendor can maintain its Customer organizations while preserving history.
15	Deactivation Preserves Historical Records	Must Have	As BridgeControl, I want to preserve relevant historical records when users, Customers, Vendors, Installations, or other entities are deactivated, so that auditability and operational history are not destroyed by lifecycle changes.
16	Vendor Administrator Assigns and Revokes Technician Customer Access	Must Have	As Vendor Administrator, I want to assign and revoke which Customers a Technician may access, so that Technicians can work only with the Customers I authorize.

17	Technician Cannot Change Own Customer Assignments	Must Have	As Vendor Technician, I want to be prevented from changing my own Customer assignments, so that Customer scope remains controlled by Vendor administration.
18	Relevant Administrator Manages Customer Administrators and Customer Users	Must Have	As Relevant Administrator, I want to create, view, edit, and deactivate Customer Administrators and Customer Users within my scope, so that Customer access can be administered by the appropriate organization.
19	Customer Administrator Assigns and Revokes Installation Access	Must Have	As Customer Administrator, I want to assign and revoke which Installations a Customer User may access, so that users can work only with the Installations they are responsible for.
20	Customer User Cannot Change Own Installation Assignments	Must Have	As Customer User, I want to be prevented from changing my own Installation assignments, so that Installation scope remains controlled by Customer administration.
21	Cross-Vendor Access Is Rejected by Database and Authorization Boundaries	Must Have	As BridgeControl, I want to prevent a Vendor request from accessing another Vendor's database or resources, so that Software Vendor isolation is enforced physically and logically.
22	Cross-Customer Access Is Rejected Within a Vendor Database	Must Have	As BridgeControl, I want to prevent users from accessing Customers outside their authorized Customer scope, so that Customers remain isolated even when they share the same Vendor database.
23	Assigned Resource Scope Limits Technician and Customer User Access	Must Have	As BridgeControl, I want to apply Technician Customer assignments and Customer User Installation assignments to every protected operation, so that delegated permissions cannot exceed assigned resources.
24	Direct Identifier, Search, List, Count, Download, Log and History Access Is Tenant-Safe	Must Have	As BridgeControl, I want to apply the same authorization boundaries to direct IDs, lists, searches, counts, downloads, logs, revisions, deployment history, and audit history, so that indirect access paths cannot leak unauthorized resources.

Milestone 2 - Software Catalog

#	Story	Priority	User Story
1	Vendor Administrator Manages Product Lifecycle and History	Must Have	As Vendor Administrator, I want to create, view, edit, retire, and preserve the history of Products, so that the Vendor can maintain a reliable software catalog.
2	Vendor Administrator Manages Product Version Lifecycle	Must Have	As Vendor Administrator, I want to create, view, edit draft metadata, and retire Product Versions, so that software releases can be managed deliberately.
3	Released Product Versions Are Protected from Silent Mutation and Destructive Deletion	Must Have	As BridgeControl, I want to protect released or referenced Product Versions from silent mutation or destructive deletion, so that deployments and historical records remain reproducible.
4	Vendor Administrator Uploads and Reviews Version MSI	Must Have	As Vendor Administrator, I want to upload and review the MSI associated with a Product Version, so that BridgeControl has the installer required to deploy that Version.
5	MSI Upload Is Validated, Atomic and Integrity-Checkable	Must Have	As BridgeControl, I want to validate MSI uploads, reject incomplete uploads, and support integrity verification, so that Agents never execute incomplete or unexpectedly changed installer artifacts.
6	Vendor Administrator Uploads and Reviews Version JSON Schema	Must Have	As Vendor Administrator, I want to upload and review the JSON Schema associated with a Product Version, so that BridgeControl can validate configuration for that Version.
7	JSON Schema Is Validated and Protected from Silent Replacement	Must Have	As BridgeControl, I want to validate uploaded JSON Schemas and prevent silent replacement of released schemas, so that configuration validation remains deterministic.
8	BridgeControl Determines Product Version Readiness	Must Have	As BridgeControl, I want to mark a Product Version deployable only when its required MSI, JSON Schema, and Product Version Default are valid, so that incomplete Versions cannot be assigned for deployment.
9	Vendor Administrator Assigns and Removes Products for Customers	Must Have	As Vendor Administrator, I want to assign Products to Customers and remove assignments safely, so that Customers receive only software they are entitled to use.
10	Vendor Administrator Manages Customer License Entitlement and Status	Must Have	As Vendor Administrator, I want to assign, review, and revoke Product license entitlement for Customers, so that license state is centrally controlled and visible.
11	Vendor Administrator Assigns Valid Desired Product Version to Installation	Must Have	As Vendor Administrator, I want to select a valid desired Product Version for an authorized Installation, so that BridgeControl knows the software state that Installation should reach.

Milestone 3 - Agent Connectivity

#	Story	Priority	User Story
1	Authorized User Obtains and Installs the BridgeControl Agent	Must Have	As Authorized User, I want to obtain and install the BridgeControl Agent, so that a Customer machine can participate in BridgeControl management.
2	Agent Registers an Installation Safely, Idempotently and with Authorization	Must Have	As BridgeControl Agent, I want to register an Installation securely without creating duplicates on repeated requests, so that BridgeControl has one trusted Installation identity for the machine.
3	Agent Generates and Protects a Non-Exportable Private Authentication Key	Must Have	As BridgeControl Agent, I want to generate and protect my private authentication key using OS-protected or hardware-backed storage, preferably non-exportable and TPM-backed where supported, so that the credential used to prove Installation identity is difficult to extract or copy.
4	BridgeControl Stores the Matching Public Verification Key	Must Have	As BridgeControl, I want to store only the public verification key corresponding to an Agent's private key, so that I can verify Agent identity without storing the private credential.
5	Agent Authenticates by Proving Possession of Its Private Key	Must Have	As BridgeControl Agent, I want to authenticate by proving possession of my private key, so that BridgeControl can verify that requests originate from the registered Installation.
6	Agent Credentials Are Installation-Bound, Revocable and Vendor-Database-Safe	Must Have	As BridgeControl, I want to bind Agent credentials to one Installation, make them revocable, and resolve them to the owning Vendor database, so that an Agent cannot authenticate as or access data belonging to another Installation or Vendor.
7	Installation Identity Persists Across Normal Agent Restart	Must Have	As BridgeControl Agent, I want to retain my Installation identity across normal restarts, so that routine restarts do not create new Installations.
8	Authorized User Chooses Existing or New Installation During Reinstallation or Replacement	Must Have	As Authorized User, I want to choose whether a reinstall or replacement reconnects to an existing Installation or creates a new one, so that BridgeControl does not guess the business identity of replacement hardware.
9	Authorized Administrator Views and Decommissions Installations	Must Have	As Authorized Administrator, I want to view and decommission Installations within my scope, so that unused Installations can be disabled while their history is preserved.
10	Agent Reports Its BridgeControl Agent Version	Should Have	As BridgeControl Agent, I want to report my own Agent version, so that administrators can identify outdated Agent software.
11	Agent Maintains Secure Heartbeat, Reconnects and Retrieves Current Desired State	Must Have	As BridgeControl Agent, I want to send heartbeats, reconnect after communication loss, and retrieve current desired state, so that BridgeControl can track connectivity and resume management after interruptions.
12	BridgeControl Tracks Latest Communication and Online/Offline State	Must Have	As BridgeControl, I want to record the latest Agent communication and derive online or offline status, so that authorized users can see whether an Installation is currently reachable.
13	Agent Reports Ordered Actual Version, Configuration and Deployment Results	Must Have	As BridgeControl Agent, I want to report actual Product Version, active configuration, and deployment results in an order-safe way, so that stale reports cannot overwrite newer Installation state.
14	Agent Reports Relevant Errors and Logs	Must Have	As BridgeControl Agent, I want to report relevant errors and log information, so that authorized users can troubleshoot managed Installations.

Milestone 4 - Configuration Management

#	Story	Priority	User Story
1	Vendor Administrator Manages Schema-Valid Product Version Default Configuration	Must Have	As Vendor Administrator, I want to define, view, and edit the server-side Product Version Default Configuration and keep it valid against that Version's JSON Schema, so that each Product Version has a valid configuration baseline.
2	Authorized User Manages Customer Configuration Profile and Overrides	Must Have	As Authorized User, I want to define, view, edit, and remove Customer-level configuration overrides within my scope, so that Customer-specific settings can override Product defaults.
3	Authorized User Manages Installation Configuration Profile and Overrides	Must Have	As Authorized User, I want to define, view, edit, and remove Installation-level configuration overrides within my scope, so that individual Installations can override broader configuration.
4	Profile Operations Respect Permission and Resource Scope	Must Have	As BridgeControl, I want to enforce both configuration permissions and resource assignments when profiles are accessed or changed, so that delegated configuration rights cannot cross Customer or Installation boundaries.
5	BridgeControl Generates Effective Configuration Using Layer Precedence	Must Have	As BridgeControl, I want to generate Effective Configuration using Product Version Default, then Customer Profile, then Installation Profile, so that the most specific applicable configuration wins predictably.
6	Effective Configuration Uses Deterministic Scalar, Object and Array Merge Rules	Must Have	As BridgeControl, I want to overwrite scalars, recursively merge objects, and replace arrays during configuration generation, so that the same inputs always produce the same Effective Configuration.
7	Null Properties and Empty Objects Are Removed Before Validation	Must Have	As BridgeControl, I want to remove null properties and recursively remove empty objects before final validation, so that generated configuration contains only meaningful settings.
8	Missing Optional Profiles Preserve Inheritance	Must Have	As BridgeControl, I want to continue inheritance when a Customer or Installation Profile does not define a value, so that omitted overrides do not erase inherited configuration.
9	BridgeControl Serializes, Stores and Revisions Effective Configuration Server-Side	Must Have	As BridgeControl, I want to serialize, store, and revision each generated Effective Installation Configuration before distribution, so that desired configuration remains centrally known and auditable.
10	BridgeControl Validates Effective Configuration Against Desired Version Schema	Must Have	As BridgeControl, I want to validate Effective Configuration against the JSON Schema for the desired Product Version, so that invalid configuration cannot be distributed.
11	Only Valid Current Configuration Revisions Are Eligible for Distribution	Must Have	As BridgeControl, I want to distribute only the current schema-valid configuration revision for an Installation, so that Agents never receive stale or invalid desired configuration.
12	Configuration Changes Recalculate Only Affected Installations	Must Have	As BridgeControl, I want to recalculate Effective Configuration only for Installations affected by a Product Default, Customer Profile, or Installation Profile change, so that configuration propagation is correct and efficient.
13	Authorized User Reviews Configuration Revision History and Drift	Must Have	As Authorized User, I want to review configuration revision history and desired-versus-actual drift within my scope, so that I can understand what changed and whether the Agent has applied it.
14	Validation and Concurrent Edit Conflicts Are Exposed Clearly	Should Have	As Authorized User, I want to receive clear validation and concurrency conflict information, so that I can correct invalid settings without silently overwriting newer changes.

Milestone 5 - Configuration Migration

#	Story	Priority	User Story
1	Vendor Administrator Defines, Reviews and Protects Valid Migration Rules	Must Have	As Vendor Administrator, I want to define and review valid migration rules between Product Versions and protect used rules from silent mutation, so that configuration transformations are explicit and reproducible.
2	Vendor Administrator Selects Direct or Chained Migration per Product	Must Have	As Vendor Administrator, I want to choose whether a Product uses direct or chained configuration migration, so that the migration strategy matches how the Product evolves.
3	BridgeControl Executes Only a Complete Configured Migration Path	Must Have	As BridgeControl, I want to execute only the Vendor-configured migration strategy when every required direct rule or chain link exists, so that missing migration rules fail safely rather than being silently substituted.
4	Target Product Version Default Replaces Source Default	Must Have	As BridgeControl, I want to use the Target Product Version Default instead of migrating the Source Product Default, so that new Vendor defaults become the base of the upgraded configuration.
5	BridgeControl Validates Source Profile State Before Migration	Must Have	As BridgeControl, I want to validate the source Customer and Installation Profile state before migration, so that migration does not start from invalid or inconsistent input.
6	BridgeControl Migrates Customer and Installation Profiles Independently	Must Have	As BridgeControl, I want to migrate Customer Profile and Installation Profile values independently between Product Versions, so that Customer and Installation-specific intent is preserved without migrating the old Effective Configuration.
7	Migration Rules Preserve, Rename, Move, Convert or Introduce Values	Must Have	As BridgeControl, I want to apply migration rules that preserve, rename, move, convert, or introduce configuration values, so that supported configuration intent can be transformed into the Target Version model.
8	Missing Migration Path Blocks Migration	Must Have	As BridgeControl, I want to block migration when the configured direct path or chained path is incomplete, so that BridgeControl never produces a guessed or incomplete configuration.
9	BridgeControl Detects and Presents Configuration Data Requiring Deletion	Must Have	As BridgeControl, I want to identify configuration data that cannot be carried forward and present it for review, so that destructive changes are visible before they occur.
10	Permissioned User Explicitly Approves Destructive Migration	Must Have	As Authorized User with Destructive Migration Permission, I want to explicitly approve required configuration data deletion within my resource scope, so that BridgeControl never silently deletes configuration data.
11	Deleted Data and Approving User Are Audited	Must Have	As BridgeControl, I want to record what configuration data was deleted and who approved the deletion, so that destructive migration remains attributable.
12	Unresolved Values Block Migration Until Permissioned Resolution	Must Have	As BridgeControl, I want to block migration when a value cannot be deterministically transformed until an authorized user resolves it, so that ambiguous configuration is not silently lost or corrupted.
13	BridgeControl Regenerates and Validates Target Effective Configuration	Must Have	As BridgeControl, I want to combine the Target Product Version Default with migrated Customer and Installation Profiles and validate the result, so that migration produces a complete Target Version Effective Configuration.
14	Failed Migration Preserves Existing Valid Configuration	Must Have	As BridgeControl, I want to leave the existing valid configuration unchanged when migration fails, so that a failed upgrade attempt does not destroy the current working configuration.
15	Migration Uses One Consistent Source Revision and Is Idempotent	Must Have	As BridgeControl, I want to perform migration from one consistent source revision and handle retries without duplicate active results, so that concurrent changes and retries cannot create inconsistent migration state.
16	Successful Migration Creates One Target Configuration Revision	Must Have	As BridgeControl, I want to create exactly one active Target configuration revision after successful migration, so that the resulting desired configuration is traceable and unambiguous.

Milestone 6 - Software Deployment

#	Story	Priority	User Story
1	BridgeControl Reconciles Actual and Desired Product Version State	Must Have	As BridgeControl, I want to compare an Installation's reported actual Product Version with its desired Product Version, so that I can determine whether deployment work is required.
2	BridgeControl Distinguishes Fresh Install, Update, Match and Unknown State	Must Have	As BridgeControl, I want to distinguish fresh installation, update, already-matching, and unknown actual Version states, so that deployment actions are selected safely instead of blindly reinstalling software.
3	Deployment Requires Valid Target Effective Configuration	Must Have	As BridgeControl, I want to require a valid Target Effective Configuration and completed migration where necessary before deployment, so that software and configuration move toward a coherent desired state.
4	BridgeControl Creates Vendor-Safe Deployment Work for Current Desired State	Must Have	As BridgeControl, I want to create deployment work in the owning Vendor database for the Installation's current desired state, so that deployment work cannot cross Vendor boundaries or execute stale intent.
5	Offline Installations Retain Pending Desired State	Must Have	As BridgeControl, I want to retain pending desired state while an Installation is offline, so that deployment can resume when the Agent reconnects.
6	New Desired State Supersedes Stale Pending Work	Must Have	As BridgeControl, I want to supersede stale pending work when the desired Version changes, so that Agents do not execute outdated deployment instructions.
7	Agent Downloads Only the Authorized Desired-Version MSI	Must Have	As BridgeControl Agent, I want to download only the MSI authorized for my Installation's desired Product Version, so that I cannot retrieve unrelated or cross-tenant installer artifacts.
8	Interrupted, Partial or Corrupt MSI Delivery Fails Safely	Must Have	As BridgeControl Agent, I want to reject or safely retry interrupted, partial, or corrupt MSI downloads, so that incomplete installer content is never executed.
9	Agent Executes Deployment Idempotently and Reports MSI Outcome	Must Have	As BridgeControl Agent, I want to execute each deployment instruction at most once and report MSI success or failure, so that retries do not cause duplicate installation work and BridgeControl receives the result.
10	Agent Retrieves and Applies the Authorized Effective Configuration	Must Have	As BridgeControl Agent, I want to retrieve and apply the exact validated Effective Configuration revision authorized for my Installation, so that the managed Product receives the intended configuration.
11	Agent Reports Configuration Application Outcome Separately from MSI Outcome	Must Have	As BridgeControl Agent, I want to report configuration application separately from MSI execution, so that BridgeControl can distinguish software installation failure from configuration failure.
12	BridgeControl Confirms Desired Version and Configuration from Reported Actual State	Must Have	As BridgeControl, I want to confirm reconciliation only when the Agent reports both the desired Version and desired configuration, so that deployment success reflects actual resulting state.
13	Installer Success Alone Does Not Reconcile Incorrect Actual State	Must Have	As BridgeControl, I want to avoid marking deployment reconciled when the installer returns success but reported actual state is wrong, so that false-positive deployment success is prevented.
14	Failure Preserves Desired State and Triggers State Re-evaluation After Interruption	Must Have	As BridgeControl, I want to preserve desired state after failure and re-evaluate state after Agent or server interruption, so that the system can recover without losing deployment intent.
15	Deployment Retries Are Controlled and Duplicate Work Is Avoided	Should Have	As BridgeControl, I want to bound automatic retries and prevent duplicate deployment work, so that recovery does not create uncontrolled execution loops.
16	BridgeControl Retains Deployment Attempt History and Install-vs-Update Distinction	Must Have	As BridgeControl, I want to retain deployment attempt history and distinguish fresh installations from updates, so that authorized users can review what happened over time.

Milestone 7 - Monitoring

#	Story	Priority	User Story
1	Vendor Administrator Views Central Installation Overview	Must Have	As Vendor Administrator, I want to view a central overview of Installations across my Vendor, so that I can monitor all Customers and Installations I administer.
2	Technician Dashboard Contains Only Assigned Customers	Must Have	As Vendor Technician, I want to see dashboard data only for Customers assigned to me, so that monitoring does not expand my Customer scope.
3	Authorized User Views Customer and Installation Operational State	Must Have	As Authorized User, I want to view operational state for authorized Customers and Installations, so that I can understand the current condition of resources I am responsible for.
4	Monitoring Shows Desired/Actual Version, Drift, Connectivity and Freshness	Must Have	As Authorized User, I want to see desired and actual Product Versions, drift, online status, and latest communication time, so that I can identify Installations that are stale or out of desired state.
5	Monitoring Shows Configuration Revision, License, Deployment Status and Outcome	Must Have	As Authorized User, I want to see configuration revision/status, license status, current deployment status, and deployment history/outcome, so that I can understand the complete managed state of an Installation.
6	Dashboard Identifies Installations Requiring Attention	Should Have	As Authorized User, I want to see Installations that require attention highlighted, so that I can prioritize operational problems quickly.
7	Authorized User Views Vendor-Scoped Installation Errors and Relevant Logs	Must Have	As Authorized User, I want to view errors and relevant logs only from Installations inside my authorized Vendor, Customer, and Installation scope, so that I can troubleshoot without exposing another tenant's information.
8	Sensitive Log Access Is Restricted	Must Have	As BridgeControl, I want to restrict sensitive log information according to permissions and resource scope, so that operational diagnostics do not become an information disclosure path.
9	Search, Filter, Aggregate and Direct Monitoring Access Enforce Authorization	Must Have	As BridgeControl, I want to apply authorization to monitoring search, filters, aggregate counts, and direct resource access, so that monitoring views cannot leak unauthorized resources indirectly.

Milestone 8 - Audit & Hardening

#	Story	Priority	User Story
1	BridgeControl Records and Retrieves Security-Relevant Administrative and Operational Audit Events	Must Have	As BridgeControl, I want to record and retrieve security-relevant administrative and operational actions in the owning Vendor database where appropriate, so that important actions remain attributable and reviewable.
2	Destructive Migration Audit Remains Independently Retrievable	Must Have	As Authorized Administrator, I want to retrieve the audit evidence for destructive migration approvals and deleted data, so that configuration deletion remains independently verifiable.
3	Historical Operational Records Remain Traceable After Deactivation	Should Have	As Authorized Administrator, I want to retain access to authorized historical operational records after entities are deactivated, so that lifecycle changes do not erase accountability.
4	BridgeControl Applies Schema Upgrades Safely Across Isolated Vendor Databases	Must Have	As BridgeControl Administrator, I want to apply and track compatible database schema upgrades across all isolated Vendor databases, so that platform upgrades do not leave Vendor databases inconsistent or inaccessible.
5	BridgeControl Supports Vendor Database Backup and Restore	Should Have	As BridgeControl Administrator, I want to back up and restore an individual Vendor database without affecting other Vendors, so that a Vendor's operational data can be recovered independently.
6	Cross-Cutting Hardening Verifies Authorization, Concurrency, Idempotency, Lifecycle and Recovery	Must Have	As BridgeControl Administrator, I want to verify authorization boundaries, concurrency controls, idempotency, lifecycle behavior, and recovery across the complete system, so that BridgeControl remains secure and consistent under failure and hostile access attempts.