NetSuite API Integration Technical White Paper

Secure OAuth 2.0 authentication, REST record services, SuiteQL, transaction automation, and production controls

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Integration expertise since 2013

Scope of this paper

This document explains the technical architecture TPSynergy uses to connect NetSuite with customers, suppliers, eCommerce platforms, 3PL warehouses, logistics providers, and other external systems. Examples are illustrative and must be adapted to each NetSuite account, enabled features, custom forms, roles, and custom fields.

Executive Summary

TPSynergy provides managed NetSuite integrations that synchronize orders, inventory, fulfillments, invoices, and other business transactions between NetSuite and external trading partners. The integration layer supports REST APIs, EDI, flat files, and partner-specific formats while presenting a consistent operational process to NetSuite users.

NetSuite REST Web Services are used for record creation and updates, transaction transformations, and data retrieval. OAuth 2.0 is used for secure token-based access so the integration does not store a NetSuite user password. All integrations are configured and tested in a NetSuite Sandbox account before production deployment.

Key design principle

TPSynergy separates partner-specific data formats from the NetSuite data model. Incoming EDI, JSON, XML, CSV, or flat-file messages are validated and transformed into a normalized business object before being mapped to NetSuite REST records.

Technical Architecture at a Glance

Trading Partners	TPSynergy Inbound	Validation & Mapping	NetSuite APIs	Monitoring
EDI / API / Files	Secure endpoints	Business rules	REST Record / SuiteQL	Logs, alerts, retry

Contents

1. Security and OAuth 2.0

TPSynergy uses OAuth 2.0, the preferred authentication method for NetSuite REST Web Services. OAuth 2.0 allows the integration to use access tokens instead of storing or transmitting a NetSuite username and password.

Supported OAuth 2.0 patterns

- Authorization Code Grant: appropriate when a NetSuite user or administrator explicitly authorizes the TPSynergy application. The flow returns an access token and refresh token. The refresh token can be used to obtain a replacement access token without prompting the user again.
- Client Credentials Grant (machine-to-machine): appropriate for unattended server-to-server integrations. NetSuite maps an integration record, entity, role, and X.509 certificate. TPSynergy signs a JWT assertion with the corresponding private key to obtain an access token.

Typical authorization-code flow

1	**Authorize**	User grants the application REST Web Services access.
2	**Exchange code**	TPSynergy exchanges the authorization code for tokens.
3	**Call API**	Access token is sent as a Bearer token.
4	**Refresh**	A refresh token obtains a new access token before expiration.
5	**Revoke**	Authorization can be revoked when access is no longer required.

Example token response

```
{
  "access_token": "<redacted-access-token>",
  "refresh_token": "<redacted-refresh-token>",
  "expires_in": 3600,
  "token_type": "Bearer"
}
```

Security controls

- Access tokens, refresh tokens, client secrets, and private keys are encrypted at rest and never written to application logs.
- The NetSuite integration role follows least-privilege principles and contains only the permissions required by the implemented transactions.

- Sandbox and production use separate account-specific endpoints, integration records, credentials, certificates, and role mappings.
- Certificates and tokens are rotated using documented operational procedures. Access is revoked when a customer relationship or integration is terminated.
- Transport uses HTTPS/TLS. Sensitive request and response fields are masked in support views and diagnostic exports.

Important

For client-credentials authentication, NetSuite requires explicit setup in every account. A sandbox refresh can clear the client-credentials mapping, so the mapping and certificate may need to be recreated after a refresh.

2. Sandbox-First Implementation

TPSynergy first implements and validates each integration in the customer's NetSuite Sandbox account. This protects production operations while the teams verify mappings, permissions, custom fields, forms, workflows, tax behavior, subsidiaries, locations, and transaction rules.

Implementation sequence

Phase	Primary activity	Exit criterion
Discovery	Confirm business process, source systems, transaction volumes, field mappings, exception scenarios, and ownership.	Approved and documented
Configuration	Enable REST Web Services and OAuth 2.0, create the integration record, define the integration role, and configure permissions.	Approved and documented
Build	Configure TPSynergy connectors, transformations, cross-reference tables, and customer-specific custom field mappings.	Approved and documented
Unit testing	Test representative payloads including valid, invalid, duplicate, partial, and out-of-order transactions.	Approved and documented
User acceptance	Business users confirm that NetSuite records, statuses, fulfillment behavior, and financial results are correct.	Approved and documented
Production cutover	Create production credentials and mappings, migrate configuration, execute smoke tests, and begin monitored processing.	Approved and documented

Recommended Sandbox test cases

- New sales order with multiple items, locations, shipping addresses, discounts, taxes, and custom body/line fields.
- Duplicate external order number to validate idempotency and duplicate prevention.
- Partial order acceptance, delayed quantities, canceled lines, and date changes.
- Partial fulfillment, split fulfillment, multiple shipments, and non-sequential NetSuite orderLine values.
- Invalid item, customer, location, subsidiary, currency, tax code, or closed accounting period.
- Authentication expiration, permission errors, network timeout, NetSuite throttling, and temporary service unavailability.

3. REST API Methods and Standard Headers

TPSynergy uses standard HTTP methods supported by NetSuite REST Web Services. The exact method depends on whether the integration is creating, retrieving, modifying, or transforming a record.

Method	Use	Typical result
GET	Retrieve a record or subresource	200 OK
POST	Create a record, execute SuiteQL, or transform a transaction	201 Created or 204 No Content
PATCH	Update selected fields without replacing omitted fields	204 No Content
DELETE	Delete a supported record when allowed	204 No Content

Common request headers

```
Authorization: Bearer <access_token>
Content-Type: application/json
Accept: application/json
Prefer: transient              # required for SuiteQL requests
X-Correlation-ID: <unique-id>  # TPSynergy tracing identifier
```

TPSynergy assigns a correlation identifier to each transaction and records the source document, NetSuite request, response status, retry count, and final disposition. The identifier allows support personnel to trace a transaction across systems without exposing credentials or sensitive payload fields.

4. Creating Sales Orders in NetSuite

Incoming orders from EDI, eCommerce, customer APIs, or files are validated and normalized before TPSynergy creates a NetSuite sales order. The standard endpoint is shown below. Replace the placeholders with the customer account-specific domain.

```
POST https://<ACCOUNT_ID>.suitetalk.api.netsuite.com/
     services/rest/record/v1/salesOrder
```

Sample sales-order payload

```
{
  "entity": { "id": "1452" },
  "subsidiary": { "id": "2" },
  "location": { "id": "6" },
  "tranDate": "2026-08-02",
  "otherRefNum": "AMZ-PO-104583",
  "memo": "Imported by TPSynergy",
  "custbody_tps_source_system": "AMAZON_EDI",
  "custbody_tps_external_order_id": "AMZ-PO-104583",
  "shipAddress": {
    "addr1": "100 Distribution Way",
    "city": "Dallas",
    "state": "TX",
    "zip": "75201",
    "country": { "id": "US" }
  },
  "item": {
    "items": [
      {
        "item": { "id": "827" },
        "quantity": 24,
        "rate": 39.95,
        "location": { "id": "6" },
        "custcol_tps_external_line": "1"
      },
      {
        "item": { "id": "912" },
        "quantity": 12,
        "rate": 54.50,
        "location": { "id": "6" },
        "custcol_tps_external_line": "2"
      }
    ]
  }
}
```

Mapping considerations

- Internal IDs in the example are placeholders. TPSynergy maintains cross-reference tables that map external customer, item, ship-to, carrier, and warehouse identifiers to NetSuite internal IDs.

- Custom body and line fields are discovered from the customer account and incorporated into the mapping. Field IDs vary by account.
- An external order identifier is stored in NetSuite and in TPSynergy to support idempotency. A repeated source message is recognized and does not create a duplicate sales order.
- NetSuite forms, workflows, SuiteScripts, approval rules, SuiteTax, and mandatory-field settings can affect the request and are tested in Sandbox.

Updating an existing sales order

```
PATCH https://<ACCOUNT_ID>.suitetalk.api.netsuite.com/
      services/rest/record/v1/salesOrder/98765

{
  "memo": "Customer requested delivery-date change",
  "shipDate": "2026-08-15"
}
```

With PATCH, omitted fields remain unchanged. TPSynergy sends only fields that must be updated, reducing the chance of overwriting values maintained by NetSuite users or workflows.

5. Creating Item Fulfillments from Sales Orders

When a warehouse or 3PL reports shipment completion, TPSynergy can transform the NetSuite sales order into an Item Fulfillment. NetSuite uses the transaction transformation endpoint below.

```
POST https://<ACCOUNT_ID>.suitetalk.api.netsuite.com/
     services/rest/record/v1/salesOrder/<SALES_ORDER_ID>/!transform/itemFulfillment
```

Sample item-fulfillment payload

```
{
  "tranDate": "2026-08-04",
  "shipStatus": "C",
  "memo": "Shipment confirmed by 3PL",
  "custbody_tps_tracking_number": "1Z999AA10123456784",
  "custbody_tps_bill_of_lading": "BOL-458901",
  "item": {
    "items": [
      {
        "orderLine": 1,
        "location": { "id": "6" },
        "quantity": 24,
        "itemReceive": true
      },
      {
        "orderLine": 4,
        "location": { "id": "6" },
        "itemReceive": false
      }
    ]
```

```
  }
}
```

Order-line caution

NetSuite orderLine values may not be sequential and should not be assumed to match the source system's line number. TPSynergy retrieves or stores the NetSuite line relationship during order creation and uses that relationship when creating partial or complete fulfillments.

Fulfillment-specific considerations

- Advanced Shipping configuration determines whether fulfillment and invoicing are independent processes.
- Lot-numbered, serialized, and bin-managed items may require inventoryDetail and inventory assignment subrecords.
- A 3PL may send several shipments for one sales order; TPSynergy supports partial quantities and multiple fulfillment records.
- Carrier, tracking number, package count, weight, Bill of Lading, and custom logistics fields are mapped according to the customer's NetSuite design.

6. Extracting Invoice Data with SuiteQL

TPSynergy uses SuiteQL through REST Web Services when a query is the most efficient way to retrieve joined or filtered transaction data. SuiteQL requests use POST, not GET, and require the header Prefer: transient.

```
POST https://<ACCOUNT_ID>.suitetalk.api.netsuite.com/
     services/rest/query/v1/suiteql?limit=1000&offset=0

Prefer: transient
Content-Type: application/json
Authorization: Bearer <access_token>
```

Sample SuiteQL request body

```
{
  "q": "SELECT t.id, t.tranid, t.trandate, t.entity, t.foreigntotal, t.status         FROM transaction t
WHERE t.type = 'CustInvc'           AND t.lastmodifieddate >= TO_DATE('2026-08-01', 'YYYY-MM-DD')
ORDER BY t.id"
}
```

Illustrative SuiteQL response

```
{
  "count": 2,
  "offset": 0,
  "totalResults": 2,
  "items": [
    {
      "id": "55281",
      "tranid": "INV104982",
      "trandate": "8/2/2026",
      "entity": "1452",
      "foreigntotal": "1612.80",
      "status": "Open"
    },
    {
      "id": "55282",
      "tranid": "INV104983",
      "trandate": "8/2/2026",
      "entity": "1604",
      "foreigntotal": "845.00",
      "status": "Open"
    }
  ]
}
```

Pagination and incremental extraction

- TPSynergy uses limit and offset parameters to page through results. For example, the second page of 1,000 rows uses offset=1000.

- Incremental queries use a controlled watermark such as last modified date plus a safety overlap window. The overlap protects against clock differences and late updates.
- Retrieved records are deduplicated by NetSuite internal ID and relevant modification timestamp before downstream delivery.
- Query columns and joins are validated against the customer's Records Catalog because available fields can vary with account features and permissions.

Correction to the original outline

The SuiteQL endpoint is called with HTTP POST and a JSON body containing the q property. The query is not placed directly in a GET request.

7. Error Handling, Retry, and Observability

Enterprise integration requires more than successful API calls. TPSynergy monitors the complete transaction lifecycle and distinguishes between business-data errors, authentication failures, permissions problems, and temporary platform or network conditions.

Category	Examples	TPSynergy action	Typical owner
Validation	Missing customer, item, location	Stop; notify with actionable detail	Business / master data
Authentication	Expired or revoked token	Refresh or reauthorize; alert if persistent	Integration administrator
Authorization	Role lacks permission	Stop; identify required permission	NetSuite administrator
Transient	Timeout, 429, 5xx	Retry with controlled backoff	TPSynergy platform
Duplicate	Order already processed	Return prior result; do not recreate	Automated idempotency
Business rule	Closed period, invalid status	Queue for correction and replay	Finance / operations

Illustrative error response

```
{
  "type": "https://www.rfc-editor.org/rfc/rfc9110.html#name-400-bad-request",
  "title": "Bad Request",
  "status": 400,
  "o:errorDetails": [
    {
      "detail": "Invalid value for location reference.",
      "o:errorCode": "INVALID_VALUE"
    }
```

```
  ]
}
```

Operational monitoring

- Dashboard status for received, validated, submitted, successful, failed, and retrying transactions.
- Email alerts for errors requiring customer or TPSynergy action.
- Payload and response audit history with sensitive values masked.
- Manual replay after correction without asking the partner to resend the original business document.
- Daily reconciliation comparing expected source transactions with NetSuite-created or updated records.

8. Data Mapping and NetSuite Customization

NetSuite implementations frequently contain custom body fields, custom line fields, custom forms, workflows, SuiteScripts, and account-specific terminology. TPSynergy extends its standard connectors through configuration and mapping rather than requiring a new integration design for every customer.

Examples of configurable mappings

External value	NetSuite target	Mapping method
Retailer PO number	otherRefNum / custom field	Direct
Retailer SKU	item.id	Cross-reference
Ship-to code	customer address / custom address	Lookup
Warehouse code	location.id	Cross-reference
External line number	custom transaction line field	Direct
Carrier SCAC	shipMethod / custom carrier field	Cross-reference

Where possible, TPSynergy keeps mapping tables and configuration outside of source code. This makes changes easier to test, approve, and deploy while preserving an audit trail.

9. Production Deployment and Managed Support

After Sandbox user acceptance, TPSynergy deploys the integration to production using a controlled cutover plan. Production endpoints and credentials are never copied from Sandbox. A production-specific OAuth setup and role mapping are created and verified.

Cutover checklist

- Create or validate production integration record, OAuth flow, role, permissions, and account-specific domain.
- Migrate approved mappings and environment variables without migrating Sandbox credentials.

- Execute controlled smoke tests for authentication, sales-order creation, retrieval, fulfillment, and SuiteQL.
- Confirm duplicate controls and establish the production processing start timestamp.
- Monitor initial transactions closely and reconcile counts with the source system and NetSuite.
- Transition to managed monitoring, exception support, and change control.

Typical service responsibilities

TPSynergy	Customer / NetSuite administrator
Connector operation, transformations, monitoring, retry, and support	Business approvals, NetSuite configuration, and master-data ownership
API compatibility review and mapping changes	Role approval and least-privilege permission decisions
Transaction audit and operational alerts	Correction of invalid customers, items, locations, and accounting setup
Deployment coordination and integration documentation	Sandbox refresh notification and UAT participation

10. Security and Readiness Checklist

Readiness item	Status / Notes
☐ OAuth 2.0 enabled and integration record created	
☐ Dedicated integration role follows least privilege	
☐ Sandbox and production credentials are separated	
☐ Tokens, private keys, and secrets are encrypted and excluded from logs	
☐ Custom fields and required fields are documented	
☐ Duplicate-prevention key is agreed and tested	
☐ Partial fulfillment and non-sequential order lines are tested	
☐ SuiteQL pagination and extraction watermark are tested	
☐ Retries are limited and do not duplicate transactions	
☐ Monitoring, alert recipients, and support escalation are defined	

Conclusion

TPSynergy combines NetSuite REST Web Services with partner-specific EDI, API, and file integrations to automate the order-to-cash and fulfillment lifecycle. OAuth 2.0, Sandbox-first testing, configurable mappings, idempotent transaction handling, monitored retries, and detailed audit trails form the technical foundation of the service.

Next step

Contact TPSynergy to review your NetSuite account, trading-partner requirements, 3PL process, transaction volumes, and implementation timeline. Email marketing@tpsynergy.com or call 812-720-3894.

Official NetSuite References

OAuth 2.0 authorization code grant flow: https://docs.oracle.com/en/cloud/saas/netsuite/ns-online-help/section_158074210415.html

OAuth 2.0 client credentials flow: https://docs.oracle.com/en/cloud/saas/netsuite/ns-online-help/section_162730264820.html

OAuth 2.0 client credentials setup: https://docs.oracle.com/en/cloud/saas/netsuite/ns-online-help/section_162686838198.html

Creating a sales order through REST: https://docs.oracle.com/en/cloud/saas/netsuite/ns-online-help/section_159793606645.html

Fulfilling a sales order through REST: https://docs.oracle.com/en/cloud/saas/netsuite/ns-online-help/section_159795518068.html

Executing SuiteQL through REST Web Services: https://docs.oracle.com/en/cloud/saas/netsuite/ns-online-help/section_157909186990.html

Updating a record with PATCH: https://docs.oracle.com/en/cloud/saas/netsuite/ns-online-help/section_1545142173.html

Disclaimer

This white paper is provided for technical planning and marketing purposes. NetSuite account features, roles, permissions, records, field IDs, endpoint behavior, and release-specific capabilities can vary. All sample account IDs, internal IDs, customer data, order numbers, tokens, and payload values are fictitious. Final integration behavior must be validated against the customer's NetSuite account and the current Oracle NetSuite documentation.