

InterSecVM/SG V4.2 for VMware

セットアップ手順書

ごあいさつ

このたびは、InterSecVM/SG V4.2 for VMware（以下、InterSecVM/SG）をお買い上げ頂き、まことにありがとうございます。

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法的情報

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目次

1	はじめに	2
1.1.	システム構成	3
1.2.	動作環境	4
2	InterSecVM/SGのインポート及びネットワーク設定	5
2.1.	vSphere Clientの場合	5
2.2.	ブラウザを利用したvSphere Web ClientまたはvSphere Host Clientの場合	12
3	InterSecVM/SGの初期導入事前準備	17
3.1.	InterSecVM/SGの初期導入環境について	17
3.2.	InterSecVM/SGの起動	19
4	InterSecVM/SGの初期導入手順	20
4.1.	初期導入の流れ	20
4.2.	初期導入の実行	21
5	かんたん設定の実施	26
6	パッチの適用	26
7	その他の設定	27
7.1.	ファイアウォールやその他サービスの設定について	27
7.2.	ftp複数ポートの設定方法	27
7.3.	メモリの追加	27
7.4.	VMwareの時刻同期の完全無効化	27
8	注意事項	28
9	使用許諾	29
9.1.	BSD Licence	29
9.2.	GNU GENERAL PUBLIC LICENSE Version 2	29
9.3.	GNU LESSER GENERAL PUBLIC LICENSE Version 2.1	35
9.4.	GNU LESSER GENERAL PUBLIC LICENSE Version 3	42
9.5.	GNU GENERAL PUBLIC LICENSE Version 3	45
9.6.	IBM PUBLIC LICENSE	66
9.7.	The OpenLDAP Public License	71

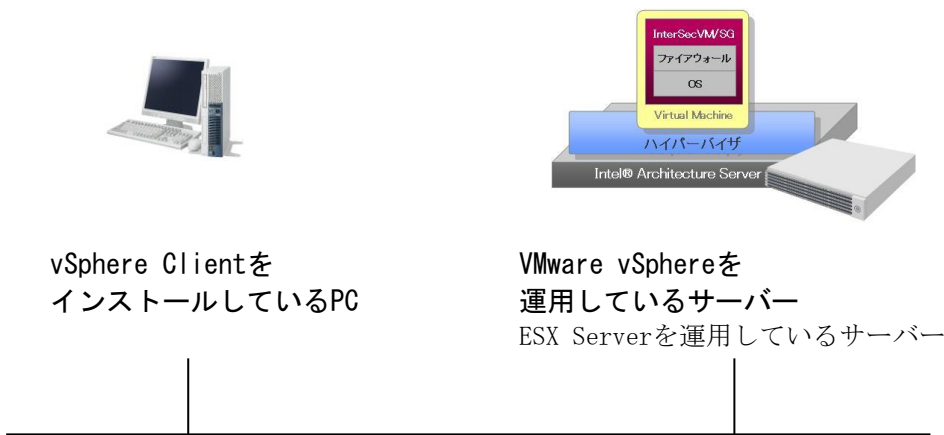
1 はじめに

InterSecVM/SGは、VMware vSphere上で利用可能な、仮想アプライアンス製品です。仮想アプライアンスとは、オペレーティングシステムと必要なアプリケーションが事前にインストールされた仮想マシンです。

本書では、InterSecVM/SGのVMware vSphereへのインポート手順と、初期導入について説明します。

1.1. システム構成

InterSecVM/SGのご利用には、VMware vSphere環境をご用意ください。



項目	説明
vSphere Client を インストールしているPC	vSphere Clientを使って VMware vSphere を設定、 管理します。Windows PCにインストールして使用し ます。 次のような機能があります。 ・仮想マシンを操作するコンソール機能 ・VMware vSphereの管理ツールとしての機能
VMware vSphereを 運用しているサーバー	VMware vSphereを運用しているサーバーは、VMwar e社から認証を取得している機種、デバイスで構成され ている必要があります。たとえば、CPUが2個搭載され ているなどの条件があります。詳細は、VMwareのマニ ュアル等を参照してください。

1.2. 動作環境

InterSecVM/SGが利用可能なVMware vSphereのバージョンは、2019年1月時点で、VMware vSphere 6(※1)です。これ以降の対応状況は、製品サイトを参照してください。

(※1) VMware vSphere 6で確認済み環境。

ESXi6.0

ESXi6.5

InterSecVM/SGの仮想マシンファイルは以下の諸元に設定しています。

リソース名	必要量
CPU	仮想CPU 1～2個(コア) 推奨2個
メモリ	2GB(初期値)～4GB
ネットワークアダプタ 1～10	LAN1 (vmnic0(VM Network)) に接続 ※1
ディスク容量(初期値)	30GB

※1 出荷状態でのネットワークアダプタ(仮想LANインタフェース)は、1～10ともVM Networkに接続するよう設定しています。

ネットワークラベル : VM Network

IPアドレス(eth0) : 192.168.250.251

ネットワークマスク : 255.255.255.0

ホスト名 : intersec.domain.local

インポートする際に、VMware vSphere に上記のメモリやディスク容量等が確保出来ない場合、InterSecVM/SGのインポートに失敗する、本来の性能を利用することができないなどの問題が発生する場合がございます。

2 InterSecVM/SGのインポート及びネットワーク設定

この章では、“vSphere Client”、もしくは“ブラウザを利用した、vSphere Web ClientまたはvSphere Host Client”を利用してInterSecVM/SG（仮想マシン）を追加する方法を記載しております。またネットワークの変更方法も記載しております。

InterSecVM/SGは、OVFテンプレートとして提供されます。

以下の手順では、「InterSecVM/SG Ver4.0」（バージョンは異なりますが、InterSecVM/SGとしての操作は変わりません。）を例として説明しています。VMwareのバージョンによって、画面レイアウト、流れが異なりますが、基本的な操作は同じため、必要に応じてVMwareのマニュアルを参照ください。

本手順は、“vSphere Client”、もしくは“ブラウザを利用した、vSphere Web ClientまたはvSphere Host Client”にログインしている状態で実施致します。

2.1. vSphere Clientの場合

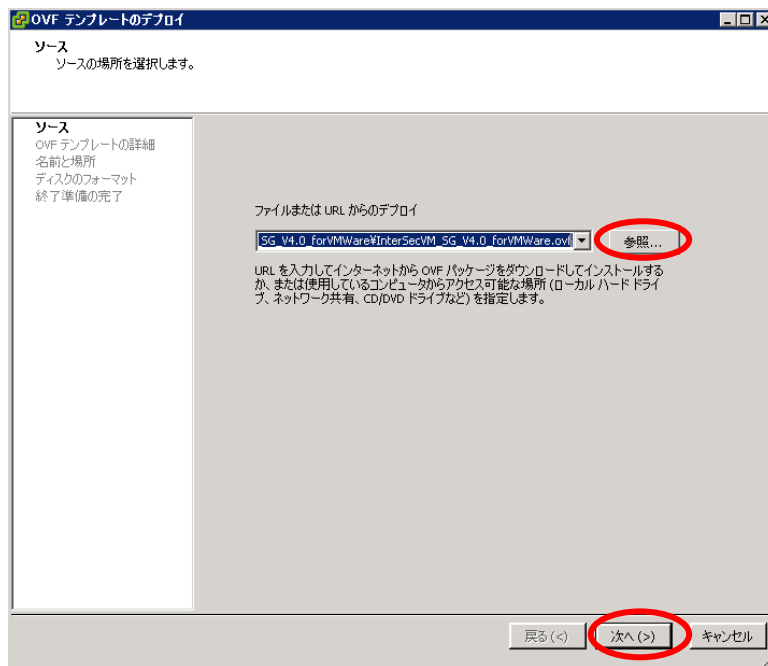
- (1) vSphere Clientの管理画面にて、[ファイル (F)] - [OVFテンプレートのデプロイ (D)] を選択します。



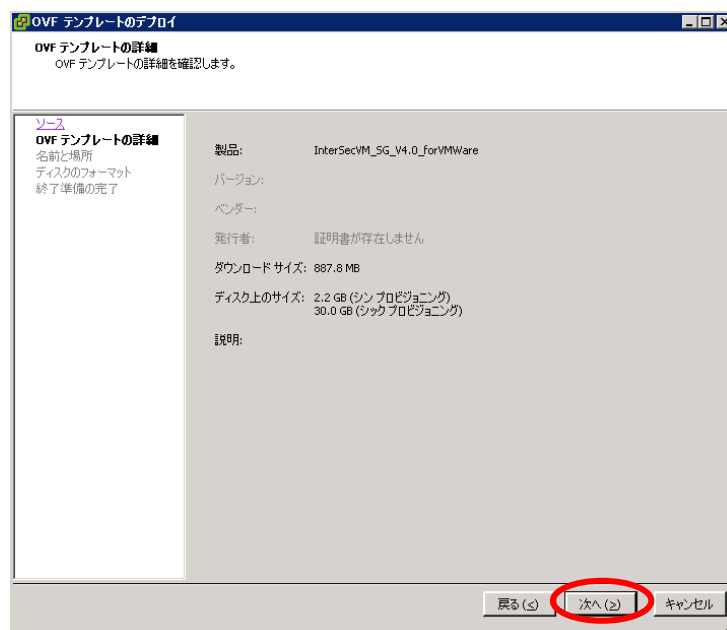
- (2) [OVFテンプレートのデプロイ] ウィザードの[ソース]選択ページが表示されます。

InterSecVM/SGのOVFファイル（例：InterSecVM_SG_V4.0.ovf）をvSphere Clientより参照可能なドライブに格納し、[参照] をクリックします。ファイル選択画面が表示されたらOVFファイルを選択して、[開く] をクリックします。

[ソース] ページに戻ったら、[次へ] をクリックします。



- (3) [OVFテンプレートの詳細] ページが表示されます。[次へ] をクリックします。



- (4) [名前と場所] ページが表示されます。
仮想マシンの名前を指定します。なお、仮想マシン名は同インベントリ内のホスト名及びクラスタ名と重複しないように設定をおこなってください。設定後、[次へ] をクリックします。

OVF テンプレートのデプロイ

名前と場所
デプロイされたテンプレートの名前と場所を指定します

ソース
OVF テンプレートの詳細
名前と場所
ディスクのフォーマット
終了準備の完了

名前
InterSecVM_SG_V4.0_forVMWare
名前は最大 80 文字で設定できますが、各インベントリのフォルダ内で一意でなければなりません。

戻る (P) 次へ (N) キャンセル

- (5) [ディスクのフォーマット] ページが表示されます。
構成するディスクのフォーマットを選択し、[次へ] をクリックします。

OVF テンプレートのデプロイ

ディスクのフォーマット
仮想ディスクはどのフォーマットで保存しますか?

ソース
OVF テンプレートの詳細
名前と場所
ディスクのフォーマット
終了準備の完了

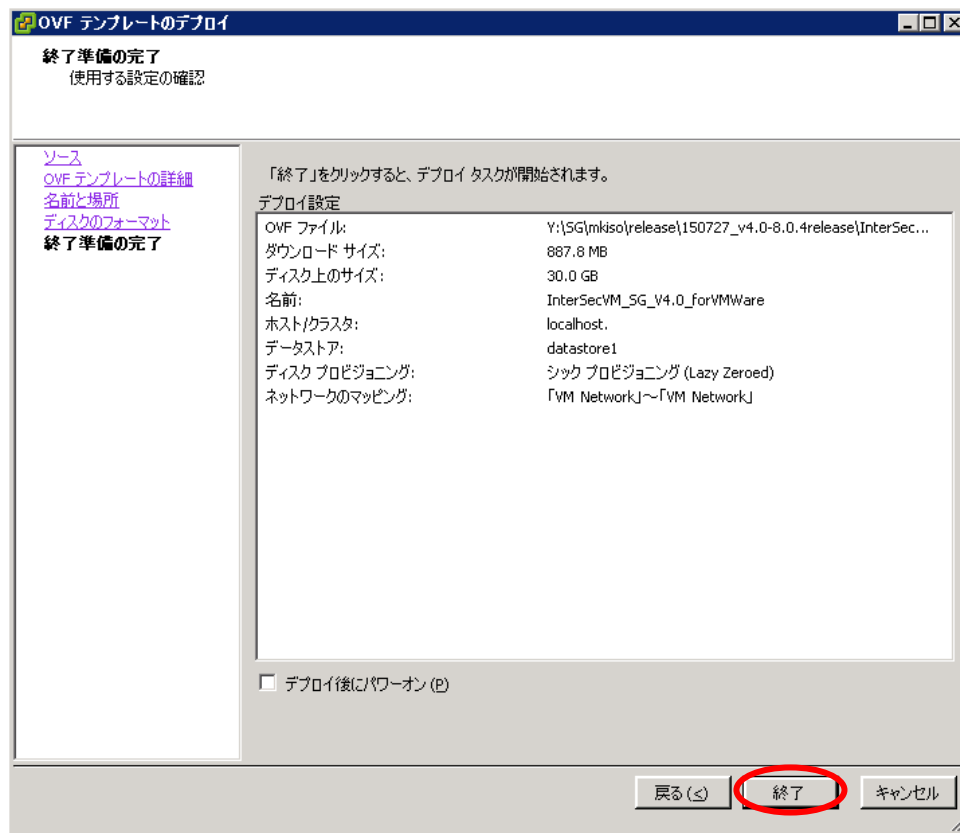
データストア: datastore1

使用可能な容量 (GB): 224.2

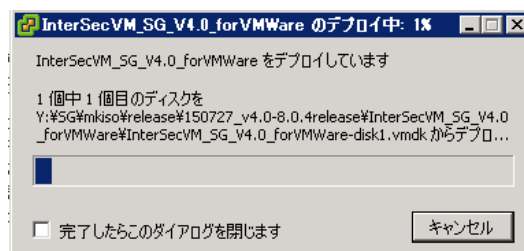
☒ シックプロビジョニング (Lazy Zeroed)
☐ シックプロビジョニング (Eager Zeroed)
☐ Thin Provision

戻る (<) 次へ (>) キャンセル

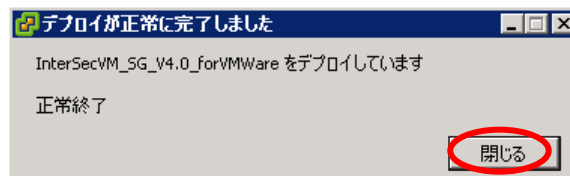
- (6) 「終了準備の完了」ページが表示されます。
デプロイ設定を確認後、「終了」をクリックします。



- (7) デプロイが開始されます。



以下のように表示されたらデプロイは完了です。「閉じる」をクリックします。



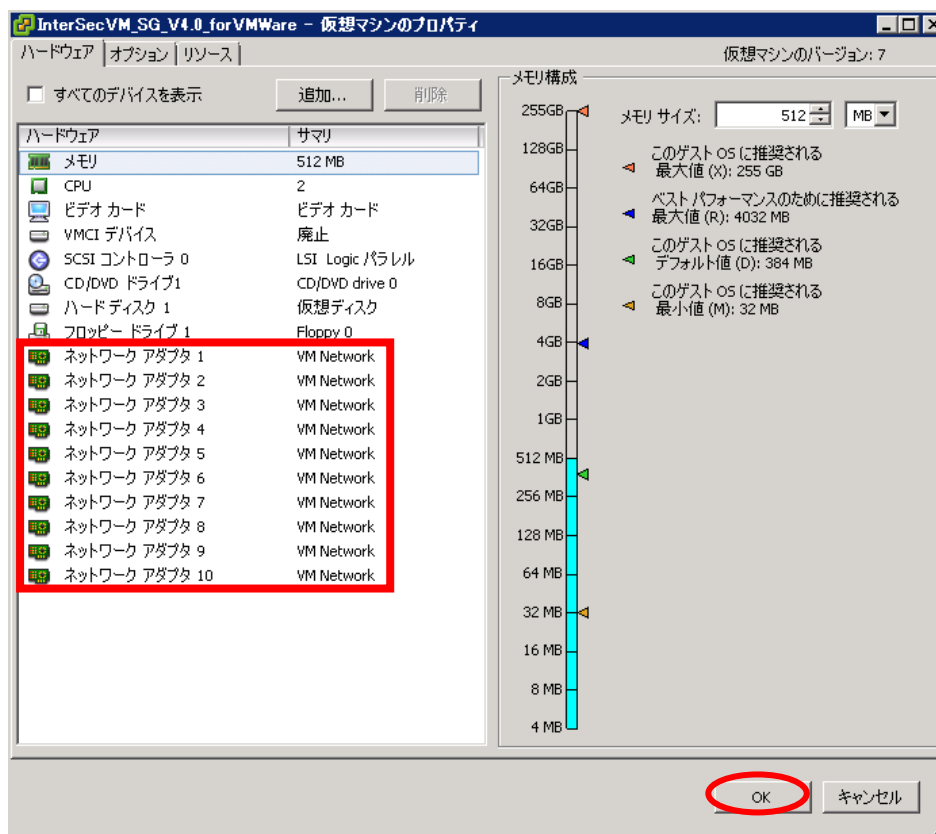
(8) InterSecVM/SGの設定を変更します。

インポートした仮想アプライアンス（仮想マシン）のネットワークアダプタが重複しないよう、「ネットワークラベル」を変更してください。

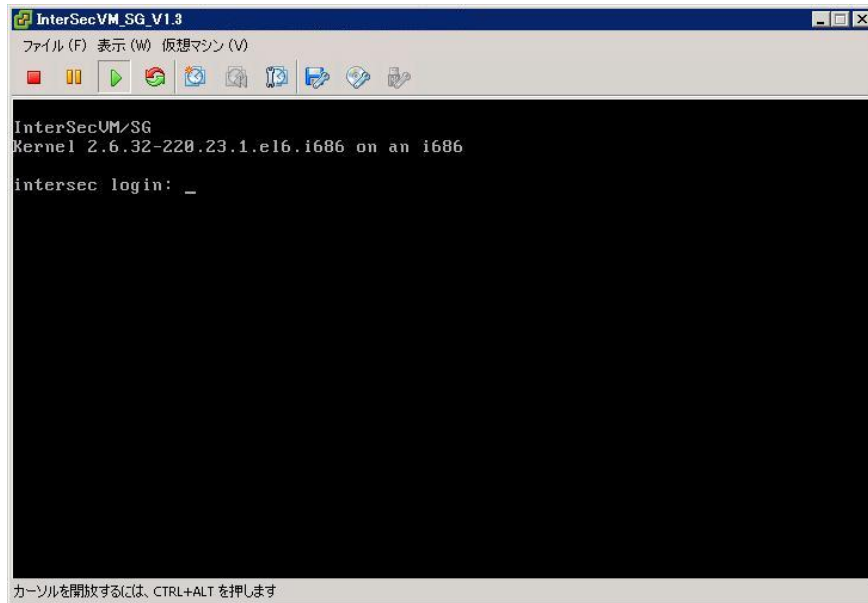
変更が完了したら「OK」ボタンを押してください。

- ・ ネットワークアダプタ 1、3～10 →外部ネットワーク以外に属するInterSecVM/SGのインタフェース(内部インタフェース)
- ・ ネットワークアダプタ 2 →外部ネットワークに属するInterSecVM/SGのインタフェース（外部インタフェース）

初期設定導入後に、ネットワークの変更があった場合は適宜本設定の見直しが必要です。



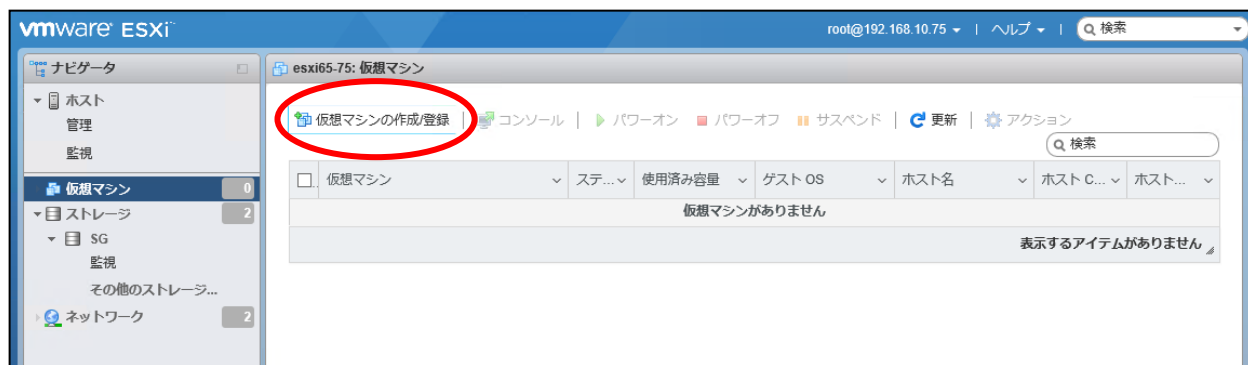
- (9) InterSecVM/SG起動確認を行います。
インポートした仮想アプライアンス（仮想マシン）をパワーオンし、
vSphere Client の[コンソール]を表示して起動確認を行います。
仮想マシンを選択してパワーオンのボタンを押してください。
ログインプロンプトが表示されたら、InterSecVM/SG が正常に起動しています。



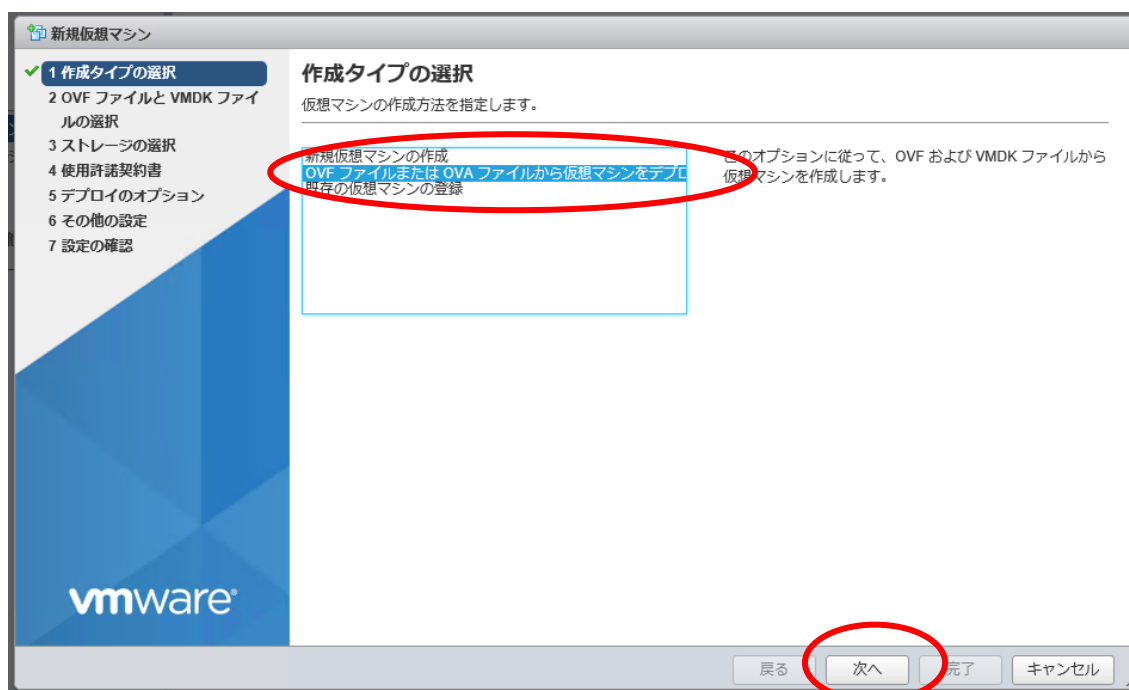
コンソールからカーソルを開放するには、<Ctrl>+<Alt> キーを同時に押します。

2.2. ブラウザを利用したvSphere Web ClientまたはvSphere Host Clientの場合

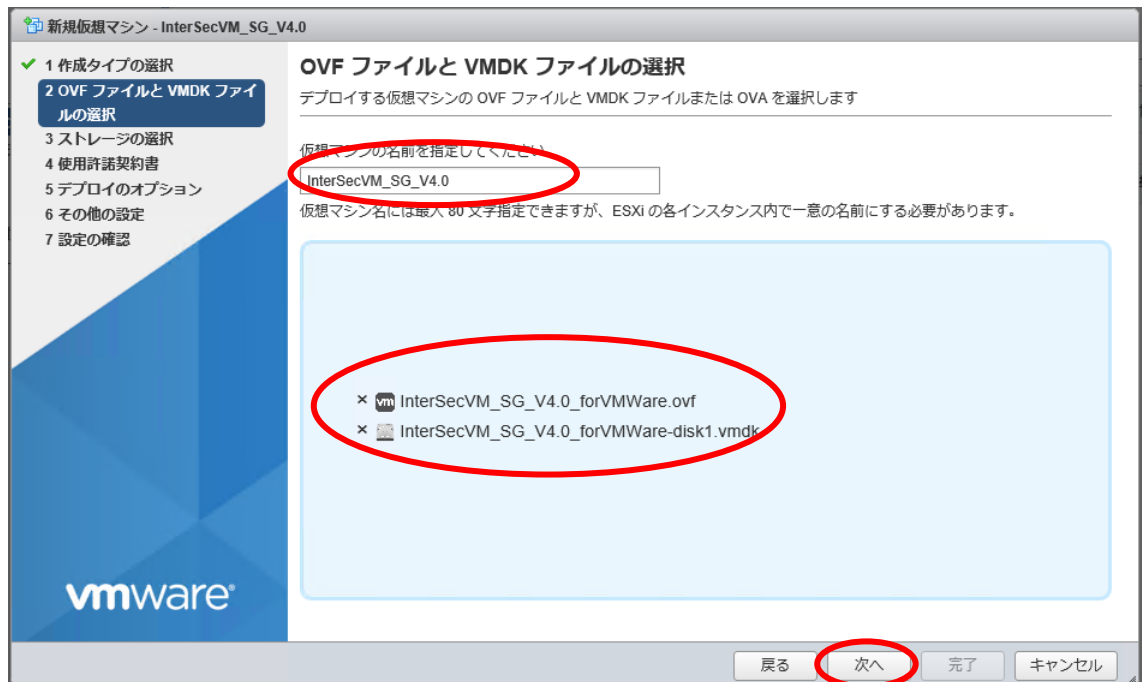
- (1) [仮想マシン] - [仮想マシンの作成/登録] を選択します。



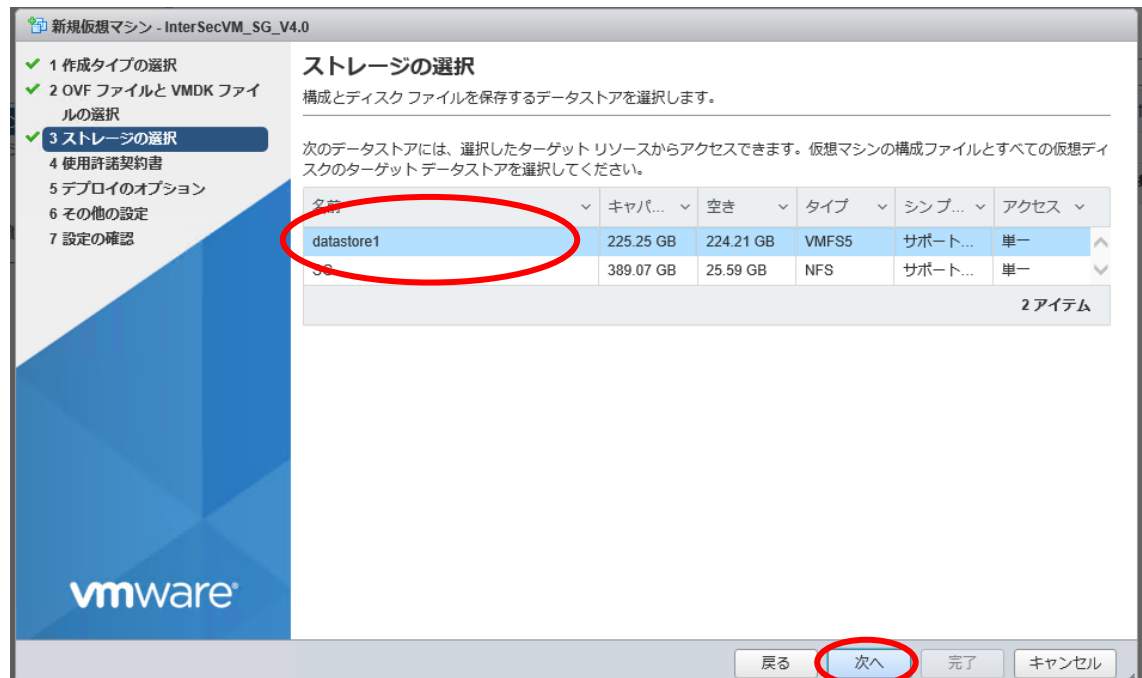
- (2) [作成タイプの選択] 画面の [OVFファイルまたはOVAファイルから仮想マシンをデプロイ] を選択し、[次へ] をクリックします。



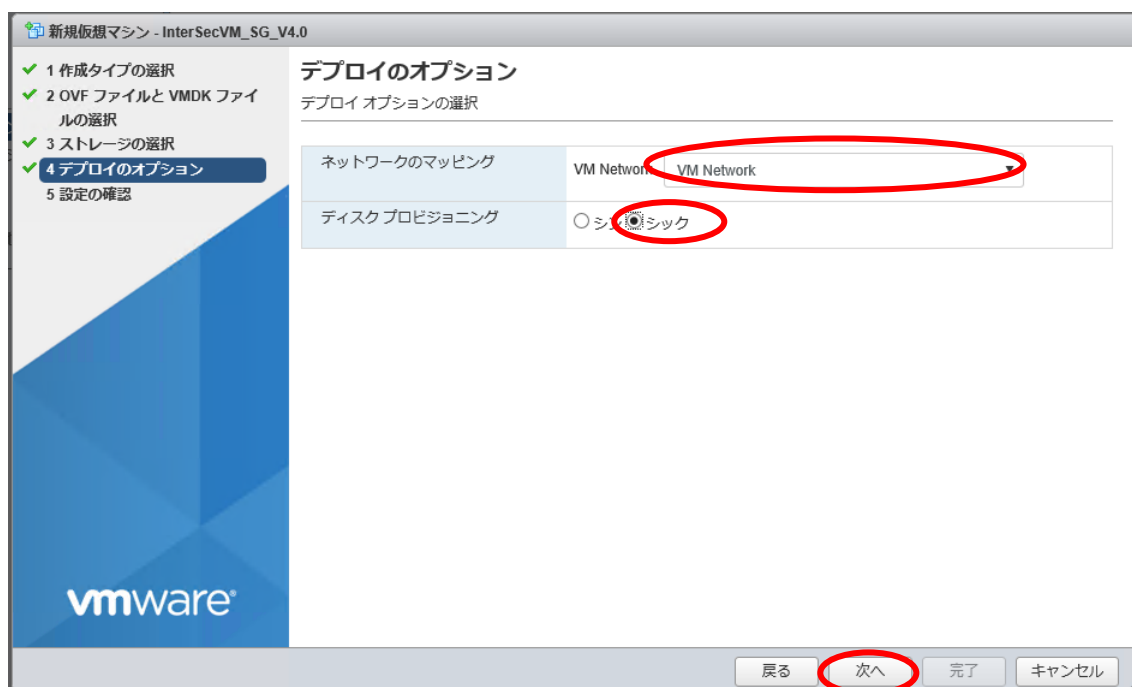
- (3) [OVFファイルとVMDKファイルの選択] ページで、仮想マシンの名前を入力し、
ovfファイルとvmdkファイルを指定、[次へ] をクリックします。



- (4) [ストレージの選択] ページで、任意のストレージを選択し、[次へ] をクリックします。



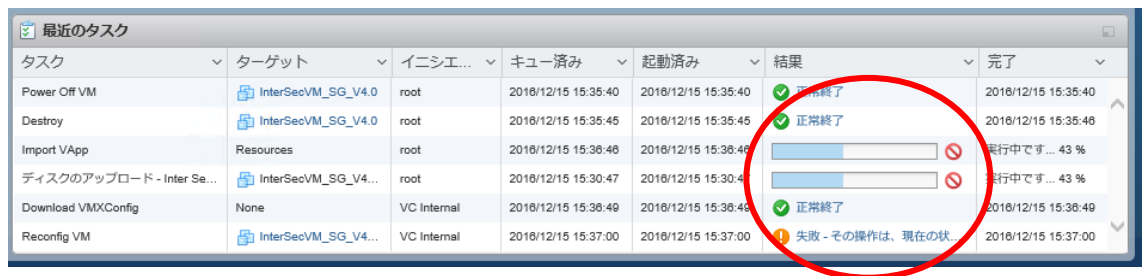
- (5) [デプロイのオプション] ページで、ネットワークのマッピングとディスクプロビジョニングを選択し、[次へ] をクリックします。



- (6) [設定の確認] ページで、設定を確認し、問題なければ[完了]ボタンをクリックします。



(7) 最近のタスクで“実行中”の表示がなくなればデプロイ完了です。



タスク	ターゲット	イニシエ...	キュー済み	起動済み	結果	完了
Power Off VM	InterSecVM_SG_V4.0	root	2016/12/15 15:35:40	2016/12/15 15:35:40	正常終了	2016/12/15 15:35:40
Destroy	InterSecVM_SG_V4.0	root	2016/12/15 15:35:45	2016/12/15 15:35:45	正常終了	2016/12/15 15:35:46
Import VApp	Resources	root	2016/12/15 15:36:46	2016/12/15 15:36:46	実行中です... 43 %	
ディスクのアップロード - Inter Se...	InterSecVM_SG_V4...	root	2016/12/15 15:30:47	2016/12/15 15:30:47	実行中です... 43 %	
Download VMXConfig	None	VC Internal	2016/12/15 15:36:49	2016/12/15 15:36:49	正常終了	2016/12/15 15:36:49
Reconfig VM	InterSecVM_SG_V4...	VC Internal	2016/12/15 15:37:00	2016/12/15 15:37:00	失敗 - その操作は、現在の状...	2016/12/15 15:37:00

(8) InterSecVM/SGの設定を変更します。

インポートした仮想アプライアンス（仮想マシン）のネットワークアダプタが重複しないよう、「ネットワークラベル」を変更してください。

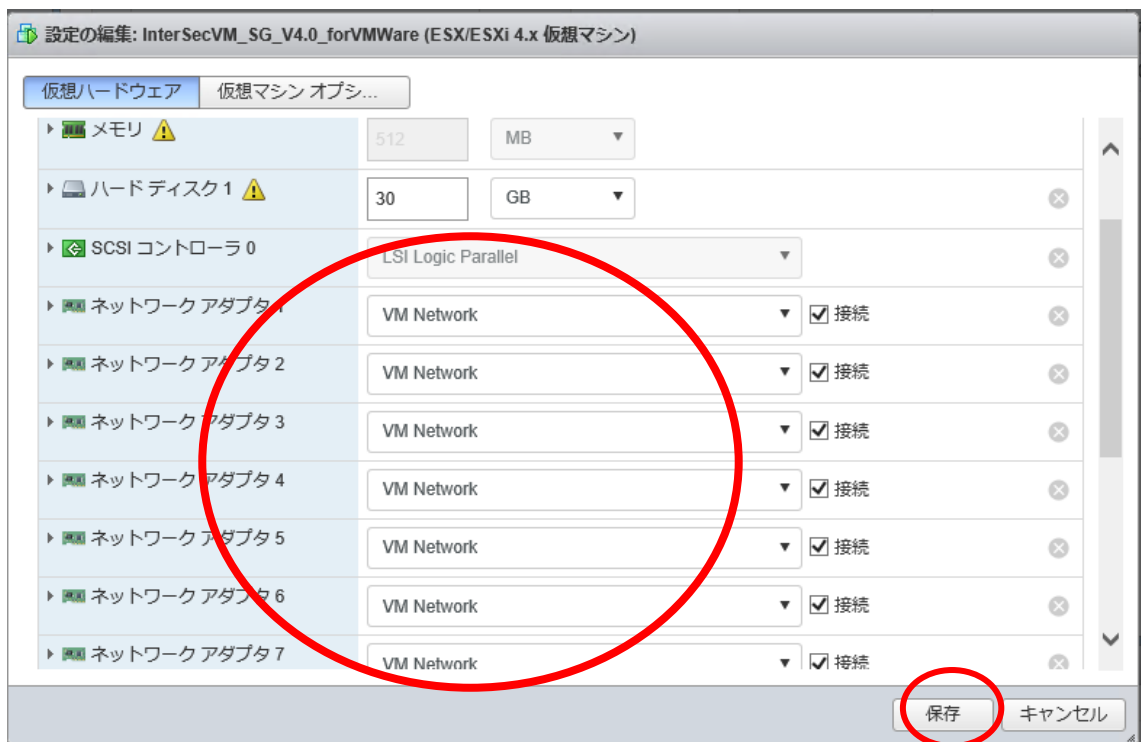
「ネットワークラベル」は仮想マシンの「アクション」-「設定の編集」-「仮想ハードウェア」で設定できます。

変更が完了したら[保存]ボタンをクリックします。

ネットワークアダプタ 1、3～10 →内部ネットワーク

ネットワークアダプタ 2 →外部ネットワーク

初期設定導入後に、ネットワークの変更があった場合は適宜本設定の見直しが必要です。

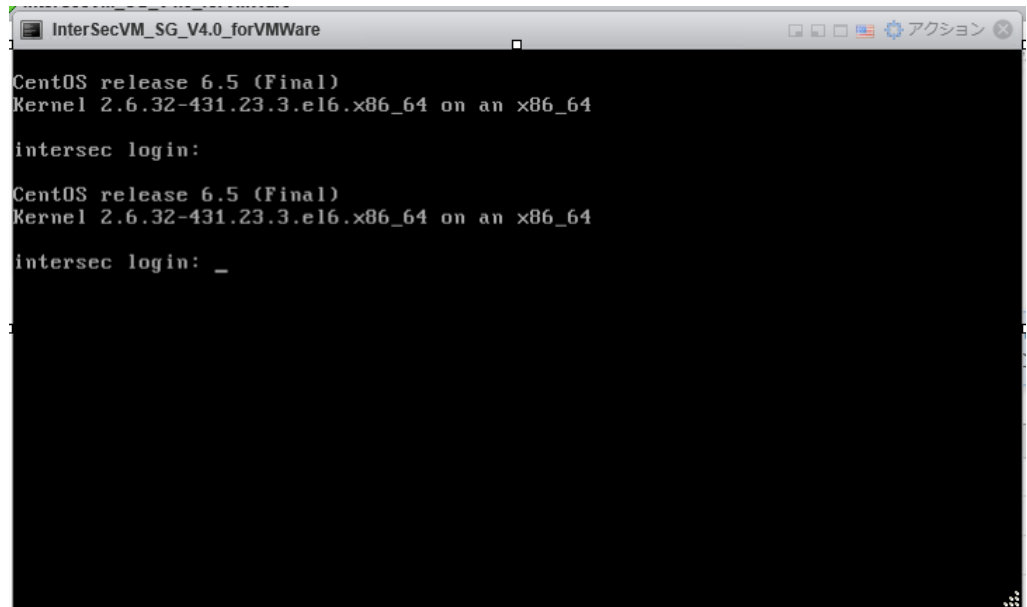


(9) InterSecVM/SG起動確認を行います。

インポートした仮想アプライアンス（仮想マシン）がパワーオンでない場合
パワーオンし、[コンソール]を表示して起動確認を行います。

仮想マシンを選択してパワーオンのボタンを押してください。

ログインプロンプトが表示されたら、InterSecVM/SG が正常に起動しています。



```
InterSecVM_SG_V4.0_forVMWare
CentOS release 6.5 (Final)
Kernel 2.6.32-431.23.3.el6.x86_64 on an x86_64

intersec login:

CentOS release 6.5 (Final)
Kernel 2.6.32-431.23.3.el6.x86_64 on an x86_64

intersec login: _
```

<補足>

下記のような警告がでてでも動作上問題ございません。

“この仮想マシンに設定されたゲストOS(CentOS 4/5以降(64ビット))は、現在実行中のゲスト(CentOS 7(64ビット))と一致しません。ゲスト固有の最適化を許可するには、正しいゲストOSを指定する必要があります。”

3 InterSecVM/SGの初期導入事前準備

前章で VMware vSphereにインポートした InterSecVM/SG は、お客様のネットワーク環境に即した状態にするために、初期導入を行っていただく必要があります。

3.1. InterSecVM/SGの初期導入環境について

InterSecVM/SGの初期導入は、別途用意いただく管理用Windows PC（以下、管理用PC）からWebブラウザを介して行います。

InterSecVM/SG のネットワーク設定は、出荷状態では以下の初期設定が行われています。

ネットワークラベル	: VM Network
IPアドレス	: 192.168.250.251
ネットワークマスク	: 255.255.255.0
ホスト名	: intersec.domain.local

初期導入を行うため、InterSecVM/SGと同じネットワークのIPアドレス（たとえば、192.168.250.1/255.255.255.0）を設定したWeb接続可能なクライアントPCを用意してください。

※ハブを介して接続する場合は、InterSecVM/SGの上記のアドレスと他機器のIPアドレスが重複しないようご注意ください。

※複数のInterSecVM/SGを導入する場合は、初期起動時のIPアドレス(192.168.250.251)が重複しないよう、1つずつ仮想ホストをインポートしてください。その後、初期導入でIPアドレスの変更を行ってください。初期導入前にIPアドレスの変更が必要でしたら、下記の手順にて、InterSecVM/SGのIPアドレスの変更を行うことも可能です。

- ① コンソールを開く。
- ② rootでログインを行う。
- ③ 右記のコマンドを入力する intersec-init-c
- ④ 画面に従い必要な情報を入力する。

Management Consoleへ接続する際、ご使用になるWebブラウザは、Internet Explorer（日本語版・Windows版）のバージョン11以上が必要です。

Internet Explorerで下記の設定を行ってください。

- ① [ツール]→[インターネットオプション]で以下のように設定してください。
 - ・ [セキュリティ]→[インターネット]を選択し[レベルのカスタマイズ]を押します。
 - [スクリプト]→[アクティブ スクリプト]→「有効にする」を選択します。
 - [その他]→[ページの自動読み込み]→「有効にする」を選択します。
 - ・ [詳細設定]→[セキュリティ]→「暗号化されたページをディスクに保存しない」のチェックを外します。
 - ・ [プライバシー]→ポップアップブロックの[設定]を「中」以下にします。

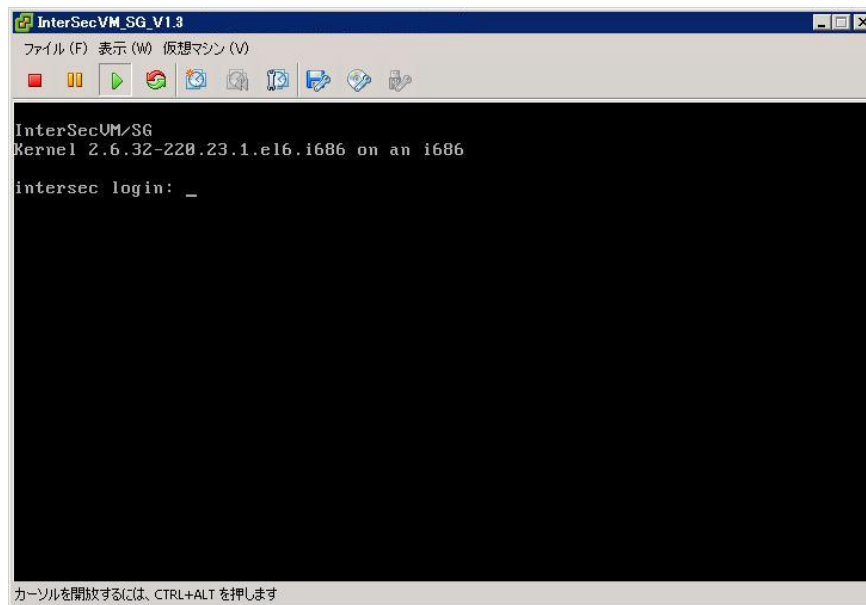
- ② [ツール]→[互換表示設定]にて、InterSecVM/SGが互換性表示の対象とならないよう

に以下のように設定してください。

- “互換表示に追加したwebサイト”にInterSecVM/SGのIPアドレスを含めないようにします。
- “イントラネット サイトを互換性表示で表示する “をチェックしており、InterSecVM/SGがイントラネット サイトに含まれる場合は、InterSecVM/SGに接続時は本チェックを無効にします。

3.2. InterSecVM/SGの起動

InterSecVM/SG と管理用PCを接続した後、仮想マシンが起動していない場合は、起動（パワーオン）してください。正常に起動するとコンソール画面に以下のようなログインプロンプトが表示されます。

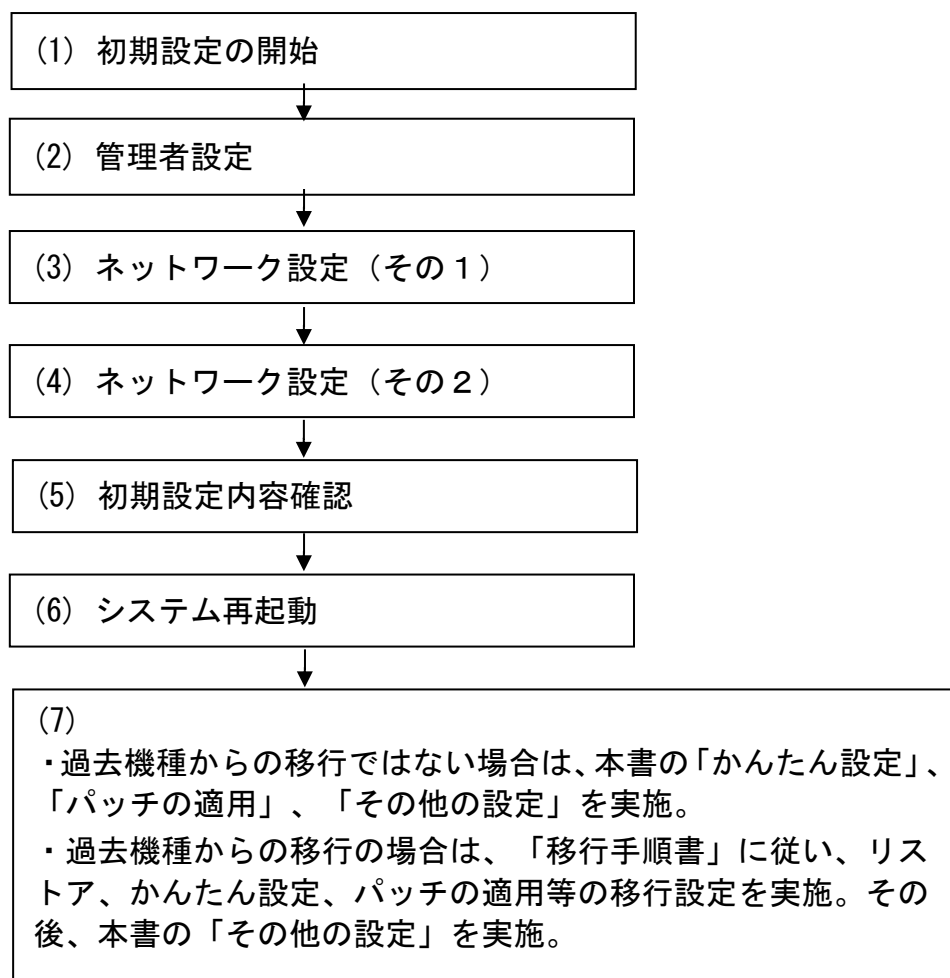


初期導入の具体的な手順は、次章を参照してください。

4 InterSecVM/SGの初期導入手順

4.1. 初期導入の流れ

InterSecVM/SGの初期導入の流れは以下のとおりです。運用するネットワーク環境に合わせて初期設定を行ってください。



4.2. 初期導入の実行

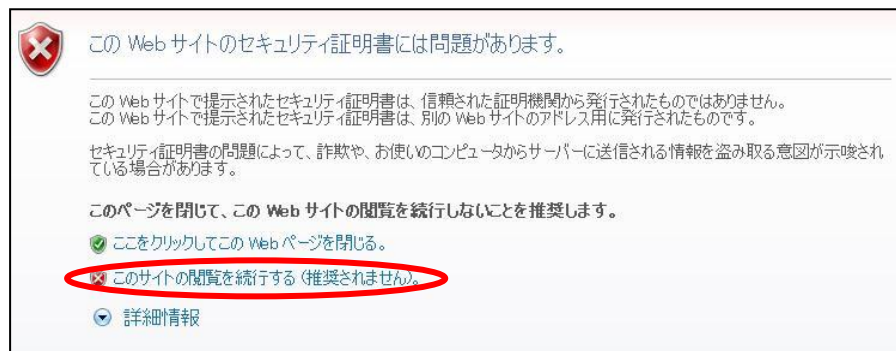
InterSecVM/SGの初期導入実行に際し、別途ご用意いただいた管理用PCのWebブラウザから InterSecVM/SG への接続、およびログインを行ってください。

■ InterSecVM/SG 初期導入画面への接続

InterSecVM/SG の初期導入画面には、管理用PCのWebブラウザで以下のURLを指定して接続してください。

<https://192.168.250.251:18000/>

セキュリティの警告が表示されますが、[このサイトの閲覧を続行する]を選択します。なお、IEのバージョンによって表示される画面は異なりますので下記は一例となります。



接続できない場合、管理用PC側から、ping コマンドなどを使用して通信状態を確認してください。

[実行例] C:¥> ping 192.168.250.251

InterSecVM/SG と通信できない場合は、設定されているネットワークと接続できるよう、管理用PCやVMware vSphereのネットワーク設定を確認してください。

■ InterSecVM/SG 初期導入画面へのログイン

InterSecVM/SGの初期導入画面に接続すると、ユーザー名とパスワードの入力ダイアログが表示されます。

初期導入画面へのログインユーザー名は「root」です。パスワードは製品添付の管理者用パスワード.pdfを参照ください。

※ユーザー名、パスワードは、大文字小文字を区別します。

(1) 初期設定の開始

ログインが成功すると以下の画面が表示されます。[Start] をクリックし、初期導入を実施します。



初期設定/initial settings

システムの初期設定をおこないます。

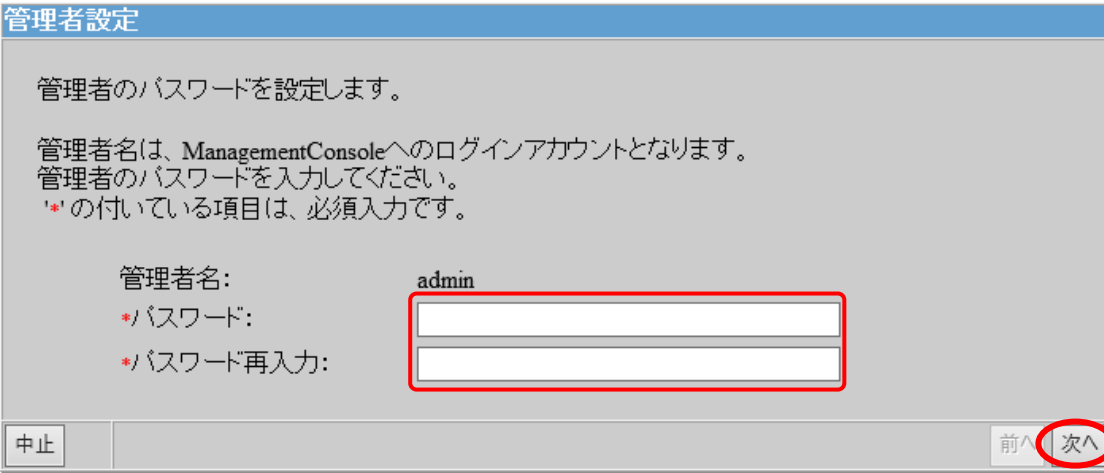
[Start]ボタンをクリックすると、初期設定を開始します。
[Stop]ボタンをクリックすると、初期設定を中止しシステムをシャットダウンします。

Stop Start

※初期設定を中断したい場合は、各設定画面の[中止] をクリックします。

(2) 管理者設定

管理者のパスワードの設定を行います。
システム管理者のアカウントは “admin” （固定）です。
システム管理者用のパスワードを「パスワード」「パスワード再入力」に入力して[次へ] をクリックします。 システム管理者名のパスワードの指定は必須です。



管理者設定

管理者のパスワードを設定します。

管理者名は、ManagementConsoleへのログインアカウントとなります。
管理者のパスワードを入力してください。
*の付いている項目は、必須入力です。

管理者名: admin

*パスワード:

*パスワード再入力:

中止 前へ 次へ

※システム管理者のアカウントは、初期導入完了後Management Console画面で変更できます。

(3) ネットワーク設定 (その1)

お客様の内部ネットワークに合わせたネットワーク情報の設定を行います。

「ホスト名(FQDN)」にはセカンドレベル以上のドメイン名を含むホスト名を入力してください。

「ホスト名(FQDN)」、「eth0 IPアドレス」、「eth0 ネットマスク」、「デフォルトゲートウェイ」、「プライマリネームサーバ」、「セカンダリネームサーバ」に設定内容を入力し、[次へ] をクリックします。

※項目名の先頭に「*」があるものは必須入力です

項目名	設定内容
* ホスト名(FQDN)	FQDNを設定します
* eth0 IPアドレス	eth0のIPアドレスを設定します。内部インタフェースのIPアドレスとなります。
* eth0 ネットマスク	ネットワークマスクを設定します
* デフォルトゲートウェイ	デフォルトゲートウェイを設定します
プライマリネームサーバ	プライマリネームサーバを設定します
セカンダリネームサーバ	セカンダリネームサーバを設定します

ネットワーク設定(その1)

システムのネットワーク基本情報を設定します。

eth0のネットワーク、デフォルトゲートウェイ、名前解決(DNS)サーバの設定をおこないます。
*の付いている項目は、必須入力です。

*ホスト名(FQDN):

*eth0 IPアドレス:

*eth0 ネットマスク:

*デフォルトゲートウェイ:

プライマリネームサーバ:

セカンダリネームサーバ:

- ☐ 255.255.255.128
- ☒ 255.255.255.0
- ☐ 255.255.128.0
- ☐ 255.255.0.0
- ☐ 255.128.0.0
- ☐ 255.0.0.0

中止

前へ

次へ

(4)ネットワーク設定 (その2)

お客様の外部ネットワークに合わせたネットワーク情報の設定を行います。
「eth1 IPアドレス」、「eth1 ネットマスク」に設定内容を入力してください。
「管理者メールアドレス」、「操作可能ホスト」は、運用上の設定です。
設定内容を入力し、[次へ] をクリックします。

- ※ 項目名の先頭に「*」があるものは必須入力です。
- ※ 「操作可能ホスト」は、初期導入完了後、Management Console画面の[リモートメンテナンス]より追加することも可能です。
- ※ 外部ネットワークに属するInterSecVM/SGのインタフェース(外部インタフェース)は、初期設定時はeth1固定となります。初期設定後、かんたん設定において外部ネットワークを変更することで他のインタフェースを外部インタフェースとすることも可能です。

項目名	設定内容
* eth1 IPアドレス	eth1のIPアドレスを設定します。外部インタフェースのIPアドレスとなります。
* eth1 ネットマスク	ネットワークマスクを設定します
* 管理者メールアドレス	管理者メールアドレスを設定します。 Webページ表示でエラーが発生した際に表示される画面に連絡先として掲載されます。 デフォルトでroot@localhostが入力されていますが変更不要でしたらそのままご使用ください。
* 操作可能ホスト	運用時にManagement Consoleに接続する管理用PCのIPアドレスを設定します

ネットワーク設定(その2)

システムのネットワーク基本情報を設定します。

eth1のネットワーク、管理の設定をおこないます。
*の付いている項目は、必須入力です。

*eth1 IPアドレス:

*eth1 ネットマスク:

*管理者メールアドレス:

*操作可能ホスト:

☐ 255.255.255.128

☒ 255.255.255.0

☐ 255.255.128.0

☐ 255.255.0.0

☐ 255.128.0.0

☐ 255.0.0.0

☐

root@localhost

中止

前へ

次へ

(5) 初期設定内容確認

入力した設定内容を確認してください。

設定内容に間違いがなければ、[次へ] をクリックしてください。

間違いがある場合は、[前へ] をクリックして変更対象画面に戻り修正してください。

初期設定内容確認

初期設定の内容を確認してください。

以下の設定でよろしければ、[次へ]ボタンをクリックしてください。設定をおこないます。
[中止]ボタンをクリックすると、初期設定を中止しシステムをシャットダウンします。

<管理者設定>	
管理者名:	admin
パスワード:	*
<ネットワーク設定(その1)>	
ホスト名(FQDN):	2012r2-176-7524.sg
eth0 IPアドレス:	192.168.10.176
eth0 ネットマスク:	255.255.255.0
デフォルトゲートウェイ:	192.168.10.63
プライマリネームサーバ:	未設定
セカンダリネームサーバ:	未設定
<ネットワーク設定(その2)>	
eth1 IPアドレス:	192.168.1.176
eth1 ネットマスク:	255.255.255.0
管理者メールアドレス:	root@localhost
操作可能ホスト:	10.8.182.215

中止前へ次へ

(6) システム再起動

設定を有効にしてシステムを運用可能な状態にするため、システムを再起動します。

[システムを再起動する] をクリックしてください。[システムを停止する] をクリックした場合、システムは停止状態となります。

システム再起動

初期設定を完了しました。
設定を有効にするために、システムを再起動してください。システム再起動後、必ずかんたん設定を実施してください。

システムを停止するシステムを再起動する

以上で、初期導入は終了です。

5 かんたん設定の実施

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下記の操作を行いましたら、**Management Console**の「ファイアウォール>かんたん設定」を実施ください。かんたん設定の内容に変更がない場合は、「次へ」ボタンを選択して、進めてください。

- ・初期設定。ただしリストアを行う場合は「システム基本情報のリストア」後にのみ実施。
- ・システム基本情報のリストア
- ・基本設定の再起動必須項目を変更しInterSecVM/SGを再起動

6 パッチの適用

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下記のホームページを参照しパッチを適用ください。

<https://www.support.nec.co.jp/View.aspx?NoClear=on&id=3140106559>

【InterSecVM/SG】リリースパッチ一覧 v4.2

パッチ適用の前に、正式なサポートライセンスの登録が必要となります。

ライセンスは、**Management Console**画面の[ファイアウォール > ライセンス確認/登録]画面よりご登録ください。詳細は、ヘルプの[ファイアウォール機能の設定方法 > ライセンスの確認と登録]を参照ください。

7 その他の設定

7.1. ファイアウォールやその他サービスの設定について

ファイアウォール機能やその他サービスの設定については、InterSecVM/SGのManagementConsoleのヘルプをご参照ください。

7.2. ftp複数ポートの設定方法

本節では、InterSecVM/SGに登録するファイアウォールルールに指定するftp通信において、ftpサーバーの制御ポートがデフォルトの21ではないときの設定手順を説明しています。

例として、以下の制御ポートを設定するときの手順を示します。

ftpサーバーの制御ポート番号
21
10021
20021

- (1)[ファイアウォール > 詳細設定 > ルール設定(サービス)]画面で、以下のユーザ定義サービスを追加してください。

名前) FTP

メンバ) tcp/21, tcp/10021, tcp/20021

- (2)システム再起動をすることにより設定が反映されます。

7.3. メモリの追加

InterSecVM/SG のご利用内容（起動するサービス）によっては、初期状態のメモリ容量（2GB）では不足する場合があります。必要に応じて最大4GBまでメモリ容量を変更することができます。仮想マシンのメモリの変更方法はVMWareのマニュアル等を参照してください。

※メモリ容量の変更は、InterSecVM/SG をシャットダウンしてから行ってください。

7.4. VMwareの時刻同期の完全無効化

InterSecVM/SGの時刻を、VMwareホストマシンの時刻より早い時刻に設定し、InterSecVM/SGを再起動した場合、InterSecVM/SGの時刻がVMwareホストマシンの時刻に補正されるという現象が発生します。これは、VMwareの仕様となります。

VMwareホストマシンの時刻より早い時刻に設定され、且つNTPサーバーなどを使用されない場合は、下記のホームページを参照し、設定を行ってください。詳細につきましては、VMWareのマニュアル等を参照してください。

<https://kb.vmware.com/s/article/1189?lang=ja>

8 注意事項

1. 1台の PC で複数の **Management Console** を同時に開かないでください。
2. 同一アカウントを使用した同時複数ログインは、サポートしておりません。
3. マニュアルに記載されていない **VMware** の設定を行われた場合はサポート対象外となります。
例) **VMware Tools** の時刻同期を使用するように変更した場合等
4. システム起動時のコンソールや **OS** のログに以下のメッセージが記録される場合がありますが、特に問題はありません。

`dm-0: WRITE SAME failed. Manually zeroing.`

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cutable

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To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to

most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the program's name and a brief idea of what it does.>
Copyright (C) 19yy <name of author>
```

```
This program is free software; you can redistribute it and/or modify
it under the terms of the GNU General Public License as published by
the Free Software Foundation; either version 2 of the License, or
(at your option) any later version.
```

```
This program is distributed in the hope that it will be useful,
but WITHOUT ANY WARRANTY; without even the implied warranty of
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
GNU General Public License for more details.
```

```
You should have received a copy of the GNU General Public License
along with this program; if not, write to the Free Software
Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA 02111-1307 USA
```

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

```
Gnomovision version 69, Copyright (C) 19yy name of author
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
```

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License.

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You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the program
`Gnomovision' (which makes passes at compilers) written by James Hacker.
```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
```

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In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

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However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The exe

cutable is

therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for

the work may be a derivative work of the Library even though the source code is not.

Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and

small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

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To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the library's name and a brief idea of what it does.>
Copyright (C) <year> <name of author>
```

```
This library is free software; you can redistribute it and/or
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License as published by the Free Software Foundation; either
version 2.1 of the License, or (at your option) any later version.
```

```
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```

```
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License along with this library; if not, write to the Free Software
Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA 02111-1307 USA
```

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```
Yoyodyne, Inc., hereby disclaims all copyright interest in the
library `Frob' (a library for tweaking knobs) written by James Random Hacker.
```

```
<signature of Ty Coon>, 1 April 1990
Ty Coon, President of Vice
```

That's all there is to it!

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